ORIGINAL ARTICLE

A Cross-sectional Study of the Mental Health Symptoms of Latin American, US Hispanic, and Spanish College Students Amid the COVID-19 Pandemic

Andy Torres[1] · Amanda Palomin[1] · Frances Morales[1] · Maria Sevilla-Matos[1] ·
Cecilia Colunga-Rodríguez[2,3] · Mario Ángel-González[3] · Luis E. Sarabia-López[4] ·
Gabriel Dávalos-Picazo[5] · Diemen Delgado-García[1] · Daniel Duclos-Bastías[6] ·
Julio Cesar Vazquez-Colunga[3] · Claudia Liliana Vazquez-Juarez[3] ·
María Pilar Egea-Romero[5] · Alfonso Mercado[1,7]

Abstract

Young adults and racial/ethnic minorities report the worst mental health outcomes during the COVID19 pandemic, according to the Center for Disease Control (2020). The objectives of this study were (1) to identify common mental health symptoms among Latin American, US Hispanic, and Spanish college students, and (2) to identify clinical features predictive of higher post-traumatic stress symptoms (PTSS) among this population. The study sample included 1,113 college students from the USA, Mexico, Chile, Ecuador, and Spain who completed an online survey containing demographic questions and mental health screeners. Findings revealed higher scores of depression, suicidality, and PTSS compared to pre-pandemic levels and current scores by non-Spanish speaking college students; however, less than 5% of participants endorsed clinical levels of anxiety. After controlling for demographic profiles and sociocultural values, clinical symptoms of depression, loneliness, perceived stress, anxiety, and coping strategies explained 62% of the PTSS variance. Age, history of mental illness, perceived social support, and familism were not significant predictors. This sample of college students revealed higher mental health symptoms during the COVID-19 pandemic. The high prevalence of PTSS highlights the need to develop pragmatic, cost-effective, and culturally sensitive prevention and intervention strategies to mitigate these symptoms. Implications for college administrators and clinicians are discussed.

Keywords COVID19 · Mental health · America Latina · Trauma · Health disparities

The World Health Organization (WHO; 2021) declared the coronavirus disease (COVID-19) as a *Public Health Emergency of International Concern* in January 2020 and a Pandemic in March of the same year. Immediately, international authorities

---

✉ Andy Torres
andy.torres01@utrgv.edu

Extended author information available on the last page of the article

implemented measures to contain further widespread of the virus, executing shelter-in-place orders, social distancing mandates, and the closure of numerous institutions. Although preventive measures were essential to mitigate the COVID-19 pandemic (Pearce, 2020), they unavoidably impacted the operation of colleges and universities worldwide. These changes affected the college student population in negative ways. Moreover, before the pandemic, college students were already at risk for mental illness (Hamza et al., 2021), and emergent research indicates that the pandemic increased such risk.

Internalizing and Transdiagnostic Symptoms Among College Students During COVID-19

Studies have shown that COVID-19 mitigation strategies are linked to the onset of post-traumatic stress symptoms, anxiety, depression, and other psychological stress across culturally diverse populations (George & Thomas, 2020; Khan et al., 2020; Kisely et al., 2020; Liang et al., 2020; Paluszek et al., 2020) and college students worldwide (Somma et al., 2021). In addition, recent studies with US samples have identified a threefold increase in the prevalence of anxiety and depression symptoms during the pandemic compared to pre-pandemic rates (Santabárbara et al., 2021). In contrast, increases in internalizing symptoms have not been observed in samples outside the USA (Hyland et al., 2021). This discrepancy may indicate that systemic and cultural factors may heavily influence changes in mental health symptoms during the pandemic.

Furthermore, the psychological impact of the pandemic goes beyond the clinical symptoms of anxiety and depression. College students report higher levels of stress and loneliness during the pandemic (Arslan et al., 2021; Charles et al., 2021; Labrague et al., 2021), which in turn are correlated to fear of COVID-19, perceived scarcity of basic needs (Hasan & Bao, 2020), and poor coping strategies (Charles et al., 2021).

Trauma Symptoms in College Students

At present, insight into trauma-related symptoms among college students during the COVID-19 pandemic is limited. Recent findings point to an increase in the PTSD prevalence rate in the general population compared to pre-pandemic levels (Salehi et al., 2021; Trnka & Lorencova, 2020). However, research examining trauma stemming from the pandemic has majorly overlooked and lacked inclusion of college students. It has been speculated that college students likely report higher symptoms of post-traumatic stress (Sánchez-Teruel et al., 2021) with minimal and contrasting empirical evidence to support these claims. However, given that the pandemic could arguably be considered a traumatic experience (Bridgland et al., 2021), further research is needed to evaluate post-traumatic stress in college students. In addition, the social consequences of the pandemic, such as economic hardships, and sudden and drastic changes to one's lifestyle, can also be considered traumatic stressors, which could lead to post-traumatic stress symptoms (PTSS) (Bridgland et al., 2021).

Coping Skills in College Students

Coping strategies are a strong predictor of mental health outcomes among college students. A recent study revealed that students engaging in maladaptive coping skills (e.g., substance use, binge eating) were more likely to score higher in internalizing symptoms (Savitsky et al., 2020). It remains unclear whether there is a correlation between demographic profiles and coping skills during the COVID-19 pandemic, as emerging research relies on correlational and cross-sectional designs. For example, Babicka-Wirkus et al. (2021) identified more coping skills in younger college students than older students, while Sheroun et al. (2020) identified the exact opposite. Furthermore, these discrepancies in recent findings further emphasize the need for further research evaluating coping skills and their effect on college students.

Familism and Social Support

Latin American (LATAM) and US Hispanic adults report high levels of the cultural value, familism (Ayón et al., 2010; Gonzales, 2019). These findings suggest that the individual values the family's well-being over the self. High familism values may function as perceived support within the family unit, ameliorating mental health symptoms (Ayón et al., 2010). However, stay-at-home orders and social isolation mandates have discouraged family gatherings, resulting in decreased perceived support from family during the pandemic. Familism may also entail a strong sense of obligation and duty to the family (e.g., caretaking, financial support) which may also be a source of stress during the pandemic (Campos et al., 2014; Corona et al., 2017). However, the role of familism remains unexplored among LATAM and US Hispanic college students.

Social support is conceptualized as a multidimensional construct that includes family support, community support, and significant-other support (Zimet et al., 1988). Social support is a crucial protective factor for mental wellbeing. However, U.S. Hispanics report low levels of perceived community support (Mulvaney-Day et al., 2007). Limited access to cultural activities, scarcity of Spanish-provided services, and perceived hostility can decrease the perceived social support among Hispanics in the U.S., which can partially explain why social support may not always act as a protective factor for Hispanics (Mulvaney-Day et al., 2007). These limitations also partially explain why young adult Hispanics seek more support from relatives than from their social network (Rivera, 2007). Despite the limited research findings, evidence suggests familism as a stronger protective factor compared to social support for both LATAM and US Hispanic students.

The Context and Situation of COVID-19 in Latin American Countries

Latin American countries have faced various challenges which place their residents at higher risk for physical and mental health symptoms. For example, Latin Americans have reported higher COVID-19 infection and mortality rates (Andrasfay & Goldman, 2021; Weng et al., 2020). In addition to the pandemic, several countries in Latin America have endured natural disasters, political turmoil, and immigration crises which hinder their ability to effectively respond to the COVID-19 pandemic (Burki, 2020; Caqueo-Urízar et al.,

2020; Ramírez de la Cruz et al., 2020). LATAM and Hispanic students also face unique challenges. For example, many LATAM and Hispanic students do not seek mental health services due the belief that their issues and concerns will not be addressed appropriately (Sharma & Bhaskar, 2020).

While LATAM students have been identified as a potentially vulnerable population in need of clinical mental health services, cultural values, such as familism, may function as protective factors to mental distress during the pandemic (Ahumada-Newhart & Hernandez, 2020; Harkness et al., 2020). The sense of support from the family unity may ameliorate the pandemic stressors in Latin American and Hispanic families (Ahumada-Newhart & Hernandez, 2020), but further research is needed to determine the role of familism on mental health in the context of the pandemic. Nevertheless, to the best of our knowledge, there are no research studies identifying the current mental health status of college students from LATAM.

The Present Study

Given the pressing need to screen for internalizing and trauma-related symptoms in LATAM and US Hispanic college students, the goals of this study were to (1) identify mental health symptoms in college students across five countries (USA, Mexico, Ecuador, Chile, Peru, Spain), and (2) to identify demographic, sociocultural, and clinical predictors of PTSS among the sampled population. For the latter, it was hypothesized that, after controlling for demographic and cultural variables of familism and social support, higher COVID anxiety, loneliness, stress, and depression and lower coping skills would predict higher PTSS.

Methods

Procedure

The sample for this international study consisted of college students over the age of 18. A total of 1113 college students were sampled via the online survey distribution software, Qualtrics (citation). The survey was distributed via email servers through the corresponding author's institutions. For the US sample, participants were recruited via an undergraduate general psychology participant pool (SONA); students completed the survey in exchange for course credit (1 h). All data was collected in the summer of 2021, June through August of 2021. The study received approval from the institution of the lead author of this manuscript.

Setting

The authors of this study are part of an international psychological health coalition named *Red Cuerpos Académicos e Investigadores Internacionales para el Desarrollo Humano Sustentabl*e (*International Network of Academics and Researchers for Sustainable Human Development*). The countries sampled correspond to the authors' country of origin.

Accordingly, the sample included college students from five different universities, each corresponding to one of five countries: the USA, Mexico, Ecuador, Spain, and Chile.

The US sample was drawn from a multi-campus university located in the southernmost region of the USA which borders Mexico. The university has a predominantly Hispanic student population of approximately 30,000 students. The student body has access to free on-campus counseling services, and off-campus low-cost mental health services.

The Mexico sample was from a public Mexican university located in the western center of Mexico in the second biggest city in the country serving over 116,000 students. Its student body is entitled to public health services and have access to medical and health services through the most important Public Health Institution in Mexico, where health problems are treated completely free of charge.

The Chilean sample participants were students from a public university serving 17,000 undergraduate students. The university is located in the central zone of Chile in the city of Valparaíso, with offices in other districts, including Santiago, Chile. The institution provides free mental health and wellness services to its student body.

The Ecuadorian sample was recruited from a public university located in Quito, Ecuador. This public university has an approximate student body of 10,000 students. It is the largest and oldest university in the country and continent of South America, serving undergraduate, graduate, and postgraduate students in multiple disciplines including psychology. Its students have free access to mental and health services via its in-campus health entities.

Participants from Spain were sampled from a private educational institution with the largest volume and tradition in Spain. This university serves over 8,000 students, and they receive free mental health services from the institution.

Participants

The final sample included a total 1,113 college students from the USA (49.68%, $n=553$), Mexico (8.8%, $n=98$), Ecuador (23%, $n=256$), Chile (12.4%, $n=138$), Spain (2.5%, $n=28$), and other (0.9%, $n=10$); a total of 2.7% participants ($n=30$) did not respond to this survey item. The sample had a mean age of 21.45 (5.25), with a range of 18–100. A slight majority of the study surveys were answered in English Language (56.3%, $n=627$). A total of 29.7% ($n=331$) answered in the affirmative to having access to health services. The majority of the sample reported a history of mental illness (18.3%, $n=191$). Table 1 contains full details of demographic profiles and descriptive statistics of the variables.

The eligibility criteria to participate in this study were to (1) be at least 18 years of age and (2) be enrolled in a college, university, or higher education institution. There were no explicit exclusion criteria. However, because the study was an online survey, only those with access to Internet services and to an Internet-capable mobile or P.C. device were able to participate in this study. For potential participants from the USA, reasons to not participate included the availability of other studies in the SONA study pool which required less time or were more aligned to students' interests. For both Latin American and Spanish samples, reasons for not participating in this study likely included technical issues (two participants from Chile emailed the authors to describe an error message they received). Another potential reason is financial burden given that in several Latin American countries Internet usage is charged per data usage.

Table 1 Comparative demographics and confounding variables by country

	USA n=553 (49.68%)	Mexico n=98 (8.8%)	Chile n=138 (12.4%)	Spain n=28 (2.5%)	Ecuador n=256 (23%)	Other n=10 (0.9%)	Total n=113	Statistic
Demographic variable								
Age	20.89 (5.57)	20.78 (3.54)	22.96 (5.26)	20.64 (1.47)	22.11 (5.01)	22.2 (6.68)	21.45 (5.25)	$F(5, 1067)=4.94$, $\eta^2=0.02$
Gender								$X^2=41.25$***
Male	137 (24.8%)	20 (20.4%)	59 (42.8%)	5 (17.9%)	89 (34.8%)	2 (20%)	312 (28.8%)	
Female	412 (74.5%)	76 (77.6%)	75 (54.3%)	23 (82.1%)	166 (64.8%)	8 (80%)	760 (70.2%)	
Non-binary	3 (0.5%)	2 (2%)	4 (2.9%)	0	0	0	9 (0.8%)	
Other	1 (0.2%)	0	0	0	1 (0.4%)	0	2 (0.2%)	
Current academic status								$X^2=304.85$***
Undergraduate or technical degree	532 (55%)	86 (8.9%)	65 (6.7%)	27 (2.8%)	248 (25.6)	9 (0.9%)	967 (89.5%)	
Graduate or professional degree	20 (17.75%)	12 (10.6%)	72 (63.7%)	0	8 (7.1%)	1 (0.9%)	113 (10.5%)	
English language	548 (99.1%)	44 (44.9%)	7 (5.1%)	2 (7.1%)	2 (0.8%)	6 (60%)	609 (56.3%)	$X^2=912$***
Immigrant status	12 (2.2%)	18 (18.6%)	1 (0.7%)	1 (3.6%)	1 (0.4%)	4 (40%)	37 (3.5%)	$X^2=118.31$***
Household size	3.61 (4.01)	4.01 (1.63)	3.18 (1.59)	2.79 (1.73)	3.89 (1.73)	2.60 (1.84)	3.63 (1.66)	$F(5,1066)=6.6$***, $\eta^2=0.03$
History of mental illness	76 (14.1%)	15 (16.7%)	60 (44.1%)	9 (36%)	29 (11.8%)	2 (22.2%)	191 (18.3%)	$X^2=79.68$***
Environmental variable								
Tested positive for COVID-19	117 (22%)	19 (21.6%)	13 (9.6%)	10 (38.5%)	56 (25%)	2 (20%)	217 (21.4%)	$X^2=17.49$**
Access to services	494 (90.3%)	84 (85.7%)	136 (98.6)	28 (100%)	235 (92.2%)	10 (100%)	987 (91.7%)	$X^2=18.08$**

**$p=0.01$; ***$p=0.001$

Measures and Assessments

Depression symptoms were measured by the Patient Health Questionnaire–9 items (Kroenke et al., 2001). This scale instructs respondents to rate 9 items asking whether they have experienced symptoms of depression in the past 2 weeks. Participants answer using a 4-point Likert-type scale ranging from *Not at all* (*0*) to *Nearly every day* (*3*). Answers are totaled into a composite score, which range from 0 to 27; higher scores indicate higher symptom severity and lower scores indicate lower symptom severity. Any scores above 9 meet scale cutoff for a *likely Major Depressive Disorder diagnosis*; $\alpha = 0.92$.

Stress was measured by the 10-item Perceived Stress Scale (Cohen et al., 1983). This measure uses a 4-point Likert-type scale; answers range from (*1*) *Almost never* to (*4*) *Very often*. An example of the items is "In the last month, how often have you been upset because of something that happened unexpectedly." All scores are summed to compute a composite score. Composite scores are categorized into one of three stress severity categories: *low* (0–13), *moderate* (14–26), and *high* severity (27–40); $\alpha = 0.90$.

PTSS were measured by the 20-item Post-Traumatic Checklist for DSM-5 (PCL-5 scale) (Blevins et al., 2015). This scale consists of 20 items describing different symptoms associated to trauma. An example of an items is "In the past month, how much were you bothered by: Repeated, disturbing, and unwanted memories of the stressful experience?" Answer choices range from *Not at all* (*0*) to *Extremely* (*4*). All scores are summed to generate a total score. A cutoff of 33 was utilized for "Likely PTSD diagnosis"; this is a conservative cutoff from the 31–33 cutoff suggested range; $\alpha = 0.97$.

Loneliness was measured by the UCLA 20-item Loneliness Scale V.3 (Russell et al., 1978). Participants answered using a 4-point Likert scale ranging from *Never* (*1*) to *Often* (*4*). A sample item is "How often do you feel that you lack companionship?" This scale has a total of nine reverse-coded items. These items were reverse scored prior to summing all items into a single composite score. Lower composite scores correspond to higher levels of loneliness. This study measured this variable in a continuum; $\alpha = 0.94$.

Familism was measured by the 15-item Familism Scale (Sabogal et al., 1987). Participants answered using a 4-point Likert scale ranging from *Strongly disagree* (*1*) to *Strongly agree* (*4*). A sample item is "One should make great sacrifices in order to guarantee a good education for his/her children." All scores are summed to a composite score. Higher scores represent higher familism. This study measured this variable on a continuum; $\alpha = 0.87$.

Social Support was measured by the 12-item Multidimensional Scale of Perceived Social Support (Zimet et al., 1988). Participants responding using a 7-point Likert scale ranging from *Strongly disagree* (*1*) to *Very strongly agree* (*7*). A sample item from the scale is "There is a special person who is around when I am in need." All items were summed to generate a total score, ranging from 7 to 84, where higher scores indicate higher perceived social support. Scores were categorized into *Low* (12–35), *Medium* (36–60), and *High* support (61–84); $\alpha = 0.94$.

Coping Skills were measured by the 4-item Brief Resilient Coping Scale (Sinclair & Wallston, 2004). Participants responding using a 5-point Likert scale ranging from *Does not describe me* (*1*) to *Describes me very well* (*5*). One sample item included, "I look for creative ways to alter difficult situations." All scores are summed into a total score. Scores range from 1 to 20, where higher scores represent higher coping skills. Coping skills scores are categorized into *Low resilient copers* (4–13), *Medium resilient copers* (14–16), and *High resilient copers* (17–20); $\alpha = 0.89$.

Anxiety symptoms were measured by the Coronavirus Anxiety Scale (CAS) (Lee, 2020), a 5-item self-report measure that assesses the levels of dysfunctional anxiety associated with COVID-19. The CAS includes symptoms that respondents may have experienced over the past two weeks, such as, "I felt dizzy, lightheaded, or faint when I read or listened to news about the coronavirus." Items are rated using a 5-point Likert scale, where responses range from *Not at all* (0) to *Nearly every day* (4). Higher scores correspond to higher anxiety levels, and a score of ≥ 9 may indicate the presence of dysfunctional anxiety; $\alpha = 0.85$.

Fear of COVID-19 was measured using the 7-item Fear of Covid-19 Scale (Ahorsu et al., 2020). The FCV-19S includes items such as, "It makes me uncomfortable to think about Corona." Participants used a 5-point Likert scale, where responses range from *Strongly disagree* (*1*) to *Strongly agree* (*5*). The total score ranges from 7 to 35, where higher scores denote higher fear of COVID-19. The measure has yielded a good internal consistency; $\alpha = 0.85$.

Survey Distribution

The survey was distributed in either English or Spanish via Qualtrics (https://www.qualtrics.com/) to all five countries via email. The US sample was also recruited via an Internet participant pool, Sona Systems (https://www.sona-systems.com). The survey language defaulted to the language identified in the Internet browser of the participant; however, participants had the option to change the language if needed. The demographic items and their corresponding instructions were back-translated by collaborators of this study to ensure linguistic and cultural sensitivity. All other scales were available in Spanish.

Data Analysis

This study utilized descriptive statistics to identify the frequency of each mental health symptom. This study used a hierarchical multiple linear regression to identify descriptive, sociocultural, and clinical variables that predict the variance of PTSS in a college aged sample during the COVID-19 pandemic.

Results

Sample demographic and sociocultural profiles by country

Spanish students were more likely to be females, 82.1% ($n = 23$), $X^2 = 41.25$. Participants from Chile were more likely to have a history of mental illness. Participants from Mexico were more likely to identify as immigrants, 18.6% ($n = 18$), $X^2 = 118.31$, $p < 0.001$. A comparison of environmental variables is also included in the same table. The students from Spain, 38.5% ($n = 10$), and Ecuador, 25% ($n = 56$), were more likely to have tested positive for COVID-19 at the time of survey completion $X^2 = 17.49$, $p < 0.01$. A total of 91.7% of the sample had access to health services, with all participants from Spain and Ecuador responded to having access to health services ($X^2 = 118.31$, $p < 0.01$) (Table 1).

All but two variables revealed low to moderate effect size differences ($\eta^2 < 0.06$). The most salient differences were found in loneliness and in Fear of COVID-19 mean scores

where participants from the USA scored higher in loneliness, 58.61 (5.78), F (5, 1020), $\eta^2 = 0.18$, compared to students from the other countries; the students from the USA endorsed higher mean scores in Fear of COVID-19, 18.56 (5.78), F (5, 1020), $\eta^2 = 0.12$ (Table 2).

Bivariate Correlations

Multiple two-tailed, pairwise Pearson product-moment correlation analyses were computed to identify bivariate relationships among variables (Table 3).

Hierarchical Regression Model

To test our hypotheses, a hierarchical multiple regression analysis was used to identify if after controlling for demographic variables (language, age, gender, country, access to health services, and history of mental illness) and sociocultural variables (perceived social support and familism), mental health symptoms (depression, loneliness, fear of COVID, perceived stress, coping strategies, and COVID anxiety) predicted higher severity of PTSS. In other words, mental health symptoms predicting higher severity of PTSS beyond that provided by demographic and sociocultural variables were evaluated. The hierarchical regression was evaluated with blocks in the following order: demographic variables, sociocultural variables, and mental health symptoms variables. Table 4 contains the computed standardized regression coefficients, R^2, and change R^2 (ΔR^2).

In the first block, language, age, gender, country, access to health services, and history of mental illness were used for the demographic block, adj. $R^2 = 0.09$, $F(6, 764) = 13.20$, $p < 0.001$. The first block resulted in 9% of the variance in PTSS being accounted for by the demographic variables. Language, age, and history of mental illness were significant predictors (p's < 0.001).

In the second block, perceived social support and familism were added to control for the sociocultural variables, adj. $R^2 = 0.14$, $F(8, 762) = 17.09$, $p < 0.001$. The second block explained 14% of the variance in PTSS after controlling for demographic variables. Both perceived social support and familism were significant predictors of PTSS. Language, age, and history of mental illness remained significant predictors in the second step.

In the third and final block, depression, loneliness, fear of COVID, perceived stress, coping strategies, and COVID anxiety were added to account for mental health symptoms, adj. $R^2 = 62$, $F(14, 756) = 89.63$, $p < 0.001$. The third block resulted in 62% of the variance for PTSS explained after adding the mental health symptoms block. Depression, loneliness, perceived stress, familism, and COVID anxiety were significant predictors to higher PTSS. Age, history of mental illness, and perceived and social support were not significant predictors in the final regression model.

Discussion

The current study aimed to identify the prevalence of mental health symptoms and identify predictors of PTSS in an international sample of college students during the COVID-19 pandemic. The findings indicated a high endorsement of cardinal and transdiagnostic mental health symptoms. Combined, the 40.5% rate of likely Major Depressive Disorder, in addition to the 29.4% rate of suicidality, highlight the critical need for preventive mental

health strategies in both US and international college students. Our findings, aside from yielding a higher endorsement of suicidality, align with recent studies identifying high rates of depressive symptoms in various international samples (Aqeel et al., 2021; Somma et al., 2021; Yadav et al., 2021). Wang et al. (2020) documented an 18.04% suicidality rate in a Southern US sample, while Tasnim et al. (2020) identified a 12.8% prevalence of suicidality in Bangladeshi students. Our findings may stem from increased systemic and intrapersonal barriers to mental health services exacerbated during the pandemic. Furthermore, in LATAM countries, psychological services may be limited, and the health infrastructure may not serve the high demand for services for depressive and suicidal symptoms (Caqueo-Urízar et al., 2020).

In contrast to expected results, COVID Anxiety scores were low in this sample, with only 4% of participants endorsing anxiety levels indicative of impairment. This finding contrasts with past findings identifying higher anxiety scores among college students during the pandemic (Aqeel et al., 2021). One explanation for these conflicting results is that internalizing symptoms varied contingent on the time of year. For example, lower amounts of stress but higher levels of depression are observed during the summer period compared to both the Fall and Spring semesters (Benham, 2021). Students' mental health state may be subject to change contingent on the phase of the academic year.

In terms of differences by country, there were no significant differences in familism or social support by country. Nonetheless, there were differences in symptom severity by country but only in the transdiagnostic symptoms of Loneliness and Fear of COVID-19 scores. Given the aforementioned cultural similarities in terms of familism and social support, it is possible that other cultural values not incorporated into this study could have influenced the results of these findings.

Further, current findings displayed high levels of post-traumatic stress symptoms, with over a third of the participants (36.7%) meeting scale cutoff for a likely PTSD diagnosis. Current findings reveal prevalence rates similar to those in Chinese students, 30.8% (Chi et al., 2020). However, the current study's PTSS prevalence was higher than a recent study with college students from the USA, which revealed a 25.4% PTSS prevalence rate (Lee et al., 2021). Thus, even though college students may be equally at risk for PTSS during the pandemic regardless of racial/ethnic background, college students in LATAM countries, US Hispanics, and racial/ethnic minority students may be at an even higher risk for PTSS. Heightened risk for PTSS may be related to compounding factors including natural disasters, increased rates of organized crime violence, immigration crises, and social-political instability in LATAM as well as social and systemic barriers like limited language and culturally sensitive services for US Hispanics (Burki, 2020; Caqueo-Urízar et al., 2020).

Predictors to PTSS

The present study identified a model that predicted 61% of PTSS variance in an international college-aged sample. After controlling for demographic and cultural variables, higher symptoms of depression, perceived stress, loneliness, and COVID-19 anxiety predicted higher levels of PTSS. Depression was the highest predictor of PTSS, supporting previous findings that identified comorbidity between PTSD and depression (Angelakis & Nixon, 2015; Campbell et al., 2007). This co-occurrence is also documented in other studies identifying mental health symptoms in the general adult population (Chen et al., 2021).

Contrary to our prediction, familism was identified as a risk factor for PTSS in this international college sample. Previous findings identified familism as a protective factor

Table 2 Clinical and sociocultural variables by country

	USA	Mexico	Chile	Spain	Ecuador	Other	Total	F $(df1, df2)$	η^2
Clinical measure									
Depression $(n=1,028)$	9.24 (7.14)	10.08 (7.04)	13.6 (7.74)	8.26 (6.59)	8.09 (6.59)	11.44 (9.02)	9.62 (7.42)	10.82(5,1022)***	0.05
Anxiety $(n=1,031)$	1.61 (2.92)	1.14 (2.25)	1.29 (1.89)	2.83 (3.25)	1.95 (2.71)	2.33 (4.36)	1.65 (2.77)	2.67(5,1025)*	0.02
PTSS $(n=1,011)$	24.96 (21.35)	28.05 (19.59)	37.41 (20.11)	28.57 (17.76)	28.08 (19)	26.37 (16.47)	21.27 (6.75)	7.86(5,1005)***	0.04
Stress $(n=1,077)$	20.83 (6.29)	21.32 (7.11)	24.25 (7.21)	21.07 (6.52)	20.69 (6.94)	21.90 (6.03)	21.27 (6.74)	6.46(5,1071)***	0.03
Loneliness $(n=1,026)$	58.61 (16.61)	50.81 (13.99)	44.63 (6.37)	45.5 (4.49)	46.06 (6.40)	54.89 (17.93)	53 (14.84)	43.14(5,1020)***	0.18
Fear of COVID-19 $(n=1,026)$	18.56 (5.78)	17.53 (5.89)	16.89 (5.59)	16.67 (4.76)	18.43 (5.90)	17 (5.76)	18.17 (5.81)	2.52(5,1020)*	0.12
Coping Skills $(n=1,002)$	13.89 (3.18)	12.98 (3.23)	12.95 (3.23)	12.05 (4.31)	12.90 (3.79)	14.38 (2.06)	13.45 (3.42)	4.73(5,996)***	0.02
Sociocultural measure									
Familism $(n=1,007)$	3.03 (0.69)	2.78 (0.68)	2.73 (0.53)	2.98 (0.74)	2.91 (0.66)	3.11 (0.49)	44.23 (10.06)	5.78(5,1001)***	0.03
Social Support $(n=1,021)$	15.21 (4.15)	13.64 (4.61)	13.84 (3.97)	13.75 (4.65)	13.33 (3.58)	17.39 (2.22)	14.48 (4.13)	9.65(5,1015)***	0.05

$**p=0.01$; $***p=0.001$

Table 3 Bivariate correlation matrix

	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14
0. Age															
1. Language	12.**														
2. People in household	−0.11**	0.005													
3. Gender	−0.04	−0.093**	0.050												
4. Country	0.11**	0.804**	0.004	−0.097**											
5. Mental health history	−0.08	−0.082**	0.040	−0.125**	−0.031										
6. Access to services	0.16	0.138**	0.056	−0.049	0.186**	−0.019									
7. Familismo	0.02	−0.107**	0.041	−0.026	−0.067*	0.113**	−0.001								
8. Perceived social support	0.08	−0.185**	−0.027	0.082**	−0.151**	0.056	−0.029	0.236**							
9. Coping skills	0.06	−0.137**	−0.036	−0.028	−0.113**	0.054	−0.004	0.179**	0.379**						
10. Perceived stress	−0.09	0.066*	0.012	0.199**	0.017	−0.219**	0.044	−0.050	−0.259**	−0.325**					
11. Depression	−0.08	0.033	0.002	0.119**	−0.026	−0.301**	0.014	−0.077*	−0.219**	−0.170**	0.683**				
12. Loneliness	0.06	−0.414**	−0.006	−0.034	−0.349**	0.193**	−0.034	0.105**	0.445**	0.253**	−0.425**	−0.445**			
13. Fear of COVID	0.02	−0.073*	0.015	0.137**	−0.026	−0.016	0.043	0.106**	−0.003	−0.106**	0.216**	0.153**	−0.095**		
14. Anxiety of COVID	0.01	−0.010	0.035	0.059	0.009	−0.057	−0.053	0.055	−0.089**	−0.051	0.078*	0.184**	−0.097**	0.185**	
15. PTSS	−0.07*	0.146**	0.023	0.093**	0.084**	−0.251**	0.046	0.022	−0.259**	−0.175**	0.603**	0.713**	−0.513**	0.204**	0.207**

$**p = 0.01$; $***p = 0.001$

for internalizing symptoms among Latin-American populations (e.g., Corona et al., 2017; Valdivieso-Mora et al., 2016). However, the unique circumstances of the COVID-19 pandemic may reveal a different psychosocial function of familism for Latin American and US Hispanic adults. During the pandemic, some students may have been taken on the caregiver role within the family, increasing their risk for caretaker stress or dual responsibilities with school and family (Katiria Perez & Cruess, 2014).

Perceived social support was not found to be a significant protective factor to PTSS, which may be due to the global impact of the pandemic on mental health in the general population. There has been a reported increase in PTSS in the general public amid COVID-19. Therefore, students seeking support from family and friends may perceive lower social support as their social network may be manifesting PTSS or other mental health symptoms themselves (Carballo et al., 2021). Moreover, students seeking social support from their academic institution may find systemic barriers such as service saturation and unavailability or challenges associated with technology.

Implication for Colleges and Universities

Mental health practitioners working with college student populations must consider contextual factors and identify coping strategies that students can implement within their family dynamics, specifically among LATAM, Hispanic, and Spanish college students. The development of preventative and intervention strategies for college students can benefit from incorporating support groups led by peers of similar cultural/demographic profiles. Peer-led interventions have demonstrated high efficacy to increase attendance (Conley et al., 2020). Additionally, virtual delivery may best fit the current pandemic's situation (Ghaddar et al., 2020; McGinn et al., 2019; Talevi et al., 2020). Universities and colleges are advised to implement tailored PTSS intervention for populations with co-occurrence of other mental health symptoms, as those seen in this study. Particularly, Zeng and colleagues (2018) recommend prioritizing emotional regulation strategies in treating PTSS, as emotional regulation helps in reducing suicide risk while ameliorating the PTS and internalizing symptoms. While these recommendations may be well suited for PTSS with other co-occurring mental health disorders interventions in college students (Zeng et al., 2018), future research should aim to identify the effectiveness of this PTSS intervention in college students with co-occurring symptoms associated with the COVID-19 mental health challenges.

Strengths and Limitations

To the best of the authors' knowledge, the present study is the first international study assessing the mental health symptoms of US Hispanic and Latin American college students. First, findings from this study provide evidence for researchers, mental health practitioners, college administration officials, and policymakers supporting the need to create prevention and intervention strategies for this population. Secondly, findings supplement the emerging literature identifying correlates to PTSS among this population, which can aid in the development of psychological interventions tailored for COVID-19 trauma–related symptoms. Finally, this paper identifies that mental health screeners related to COVID-19 (and otherwise) are adequate for use with college students from LATAM, American, and Spanish populations, as they yielded *Good* to *Excellent* internal validity.

Table 4 Hierarchical regression model predicting PTSS

	Model 1				Model 2				Model 3			
	B	SE B	β	t	B	SE B	β	t	B	SE B	β	t
Intercept	42.56	3.52		12.08	46.22	4.78		9.68	9.37	4.90		1.91
Language	8.67	2.51	0.21***	3.45	7.85	2.45	0.19***	3.21	0.42	1.70	0.01	0.24
Age	−0.46	0.13	−0.13***	−3.70	−0.38	0.12	−0.11***	−3.09	−0.13	0.08	−0.04	−1.58
Gender	2.11	1.49	0.05*	1.42	2.88	1.45	0.07***	1.99	−1.04	0.99	−0.02	−1.05
Country	−1.25	0.74	−0.10	−1.69	−1.37	0.72	−0.11*	−1.91	0.25	0.49	0.02	0.50
Access to health services	1.58	1.46	0.04	1.09	1.62	1.41	0.04	1.15	0.83	0.95	0.02	0.87
History of mental illness	−11.63	1.79	−0.23***	−6.48	−11.78	1.75	−0.23***	−6.72	−1.29	1.23	−0.03	−1.05
Perceived social support					−1.21	0.18	−0.24***	−6.81	−0.06	0.13	−0.01	−0.49
Familism					0.28	0.07	0.13***	3.80	0.21	0.05	0.10***	4.32
Depression									1.23	0.10	0.45***	12.89
Loneliness									−0.28	0.04	−0.20***	−6.46
Fear of COVID									−0.02	0.09	−0.01***	−0.17
Perceived stress									0.66	0.10	0.22***	6.51
Coping strategies									0.07	0.15	0.01	0.43
Anxiety COVID									1.03	0.20	0.14***	5.24
R^2	0.09				0.15				0.62			
Adj. R^2	0.09***				0.14***				0.662***			
ΔR^2					0.06***				.47***			

**p=0.01; ***p=0.001

Nevertheless, our study was not without limitations. First, it was a survey-based study and thus was vulnerable to over- and under-reporting by participants. Second, quantitative-based methods are not a catch-all method to identify all the mental health symptoms associated with the pandemic. Qualitative and mixed-method research integrating open-ended interviews could be used to address subtle or unique symptoms and challenges encountered by this population. Moreover, the study employed a cross-sectional design, and all data was collected during the Summer of 2021. Accordingly, findings may not generalize to the long-term effects of the pandemic on the mental health of college students. Likewise, the experiences of college students during the following stages of the pandemic (e.g., Delta variant, Omicron) may have been different from those presented in this study.

The study also identified potential confounding variables such as having a history of mental illness, having a history of testing positive for COVID-19, and having (or not) access to mental health services. These are significant variables that can skew the symptom severity of internalizing symptoms. The study also had other confounding variables that were not identified, such as living in a household with a relative diagnosed with COVID-19 or with signs of it. Family dynamics related to compliance or lack of thereof to COVID-19 mitigation risk guidelines could have increased the pandemic stress of some students. Future research should aim to include these variables as covariates in predictive models. Moreover, even though the study included an international sample, external validity may be limited to college students with Internet access in each of the five countries. There is no substantial evidence to suggest that these findings apply to the entire public, and additional research is warranted.

Another confounding variable is the unique sociopolitical and systemic experience of each participating country in this study. For instance, the impact of immigration status was not explored in this study. While only 3.5% of the sample identified as immigrants, family or personal worries and stressor related to immigration could have increased the mental health concerns, confounding the results of this study. In addition, Latin American people endured various political crises that included Chile's executive overpower; Mexico's limited health infrastructure to meet demands stemming from high mortality and morbidity related to COVID-19 infection and from mental health sequelae associated with thereof.

Another limitation to this paper is using a convenience sample that may have led to biased sampling. Despite confounding variables, the entire sample from the five countries was analyzed as a single unit. While the US sample was bilingual and shared some cultural similarities with the Mexican sample, these similarities may not be found in the samples from the other countries. Furthermore, the US sample completed this study as part of a research participation requirement for undergraduate general psychology courses. Students choose to participate in studies from various active studies in the department of psychological science.

In contrast, the Latin American and Spanish samples completed the survey voluntarily. In addition, the US sample was more likely to participate in this study given that students were pooled from a participant pool of undergraduate students. In contrast, the other countries distributed the survey via email to the student body. Unfortunately, limited pragmatic resources were available to the authors to reduce bias sampling in all samples.

A final confounding variable for consideration is each participating country's unique sociopolitical and systemic experience in this study. These individual factors are worth noting that Latin America is not a monolith. In conjunction with the USA and Spain, each country had sociopolitical and environmental factors beyond the scope of this study that likely influenced the mental health of the sample.

Future Studies

Future research could be enriched by longitudinal studies to identify the long-term effects of the COVID-19 pandemic in college students. Emerging research can also benefit from incorporating mixed methods to explore culturally unique mental health challenges and impairments amidst the pandemic. While most scales rely on a single cutoff value to identify daily-life impairment, qualitative interviews could bring to light other essential aspects of academic, learning, family, and social impairment. Last, different familism and social support domains may be more salient among LATAM and Hispanic students, making such subdomains worthy of inquiry in future studies.

Conclusion

The COVID-19 pandemic impacted the mental health of the population worldwide. Groups previously identified as high risk for mental illness appear to be at higher risk for worse mental health outcomes during this pandemic. The COVID-19 pandemic caused college students to experience various challenges, including abrupt changes to instruction delivery and disruptions to their emotional and physical connections to campus/student life. In addition, a lack of perceived social and family support may have hindered students' ability to adapt to the challenges of this pandemic. Compared to prevalence rates in the general population, college students reported a higher prevalence of depression, suicidality, and PTSS. Moreover, depression was the highest predictive factor for PTSS in this international college student sample, highlighting the need for tailored psychological interventions that address emotional regulation in cases of concurrent PTSS and depressive/suicidality symptoms.

Declarations

Conflict of Interest The authors declare no competing interests.

References

Ahumada-Newhart, V., & Hernandez, M. (2020) An assets-based design approach to promote digital health equity for Latino youth and their communities," *The 23rd ACM Conference on Computer-Supported Cooperative Work and Social Computing (CSCW)*. 10.5281/zenodo.4317906

Ahorsu, D. K., Lin, C.-Y., Imani, V., Saffari, M., Griffiths, M. D., & Pakpour, A. H. (2020). The fear of COVID-19 scale: development and initial validation. *International Journal of Mental Health and Addiction*, 1-9. https://doi.org/10.1007/s11469-020-00270-8

Andrasfay, T., & Goldman, N. (2021). Reductions in 2020 U.S. life expectancy due to COVID-19 and the disproportionate impact on the Black and Latino populations. *Proceedings of the National Academy of Sciences*, *118*(5). https://doi.org/10.1073/pnas.2014746118

Angelakis, S., & Nixon, R. D. (2015). The comorbidity of PTSD and MDD: Implications for clinical practice and future research. *Behaviour Change, 32*(1), 1–25. https://doi.org/10.1017/bec.2014.26

Aqeel, M., Abbas, J., Shuja, K. H., Rehna, T., Ziapour, A., Yousaf, I., & Karamat, T. (2021). The influence of illness perception, anxiety and depression disorders on students mental health during

COVID-19 outbreak in Pakistan: a web-based cross-sectional survey. *International Journal of Human Rights in Healthcare*. https://doi.org/10.21203/rs.3.rs-30128/v1

Arslan, G., Yıldırım, M., & Zangeneh, M. (2021). Coronavirus anxiety and psychological adjustment in college students: Exploring the role of college belongingness and social media addiction. *International Journal of Mental Health and Addiction*, 1–14. https://doi.org/10.1007/s11469-020-00460-4

Ayón, C., Marsiglia, F. F., & Bermudez-Parsai, M. (2010). Latino family mental health: Exploring the role of discrimination and familismo. *Journal of Community Psychology, 38*(6), 742–756. https://doi.org/10.1002/jcop.20392

Babicka-Wirkus, Wirkus, L., Stasiak, K., & Kozlowski, P. (2021). University students' strategies of coping with stress during the coronavirus pandemic: Data from Poland. *PloS One, 16*(7), e0255041–e0255041. https://doi.org/10.1371/journal.pone.0255041

Benham, G. (2021). Stress and sleep in college students prior to and during the COVID-19 pandemic. *Stress and Health, 37*(3), 504–515. https://doi.org/10.1002/smi.3016

Blevins, C. A., Weathers, F. W., Davis, M. T., Witte, T. K., & Domino, J. L. (2015). The post-traumatic stress disorder checklist for DSM-5 (PCL-5): Development and initial psychometric evaluation. *Journal of Traumatic Stress, 28*(6), 489–498. https://doi.org/10.1002/jts.22059

Bridgland, V. M. E., Moeck, E. K., Green, D. M., Swain, T. L., Nayda, D. M., Matson, L. A., Hutchison, N. P., & Takarangi, M. K. T. (2021). Why the COVID-19 pandemic is a traumatic stressor. *PloS One, 16*(1), e0240146–e0240146. https://doi.org/10.1371/journal.pone.0240146

Burki, T. (2020). COVID-19 in Latin America. *The Lancet Infectious Diseases, 20*(5), 547–548. https://doi.org/10.1016/S1473-3099(20)30303-0

Campbell, D. G., Felker, B. L., Liu, C.-F., Yano, E. M., Kirchner, J. E., Chan, D., Rubenstein, L. V., & Chaney, E. F. (2007). Prevalence of depression–PTSD comorbidity: Implications for clinical practice guidelines and primary care-based interventions. *Journal of General Internal Medicine, 22*(6), 711–718. https://doi.org/10.1007/s11606-006-0101-4

Campos, B., Ullman, J. B., Aguilera, A., & Dunkel Schetter, C. (2014). Familism and psychological health: The intervening role of closeness and social support. *Cultural Diversity and Ethnic Minority Psychology, 20*(2), 191. https://doi.org/10.1037/a0034094

Caqueo-Urízar, A., Urzúa, A., Aragón-Caqueo, D., Charles, C. H., El-Khatib, Z., Otu, A., & Yaya, S. (2020). Mental health and the COVID-19 pandemic in Chile. *Psychological Trauma: Theory, Research, Practice, and Policy, 12*(5), 521. https://doi.org/10.1037/tra0000753

Carballo, J. L., Coloma-Carmona, A., Arteseros-Bañón, S., & Pérez-Jover, V. (2021). The moderating role of caregiving on fear of COVID-19 and post-traumatic stress symptoms. *International Journal of Environmental Research and Public Health, 18*(11), 6125. https://doi.org/10.3390/ijerph18116125

Centers for Disease Control and Prevention (CDC). (2021). CDC museum COVID-19 timeline. Retrieved February 15, 2022, from https://www.cdc.gov/museum/timeline/covid19.html#Early-2020

Charles, N. E., Strong, S. J., Burns, L. C., Bullerjahn, M. R., & Serafine, K. M. (2021). Increased mood disorder symptoms, perceived stress, and alcohol use among college students during the COVID-19 pandemic. *Psychiatry Research, 296*, 113706. https://doi.org/10.1016/j.psychres.2021.113706

Chen, Y., Huang, X., Zhang, C., An, Y., Liang, Y., Yang, Y., & Liu, Z. (2021). Prevalence and predictors of post-traumatic stress disorder, depression and anxiety among hospitalized patients with coronavirus disease 2019 in China. *BMC Psychiatry, 21*(1), 1–8. https://doi.org/10.1186/s12888-021-03076-7

Chi, X., Becker, B., Yu, Q., Willeit, P., Jiao, C., Huang, L., Hossain, M. M., Grabovac, I., Yeung, A., & Lin, J. (2020). Prevalence and psychosocial correlates of mental health outcomes among Chinese college students during the coronavirus disease (COVID-19) pandemic. *Frontiers in Psychiatry, 11*, 803. https://doi.org/10.3389/fpsyt.2020.00803

Cohen, S., Kamarck, T., & Mermelstein, R. (1983). A global measure of perceived stress. *Journal of Health and Social Behavior, 24*, 386–396. https://www.jstor.org/stable/2136404?seq=1#metadata_info_tab_contents

Conley, C. S., Hundert, C. G., Charles, J. L., Huguenel, B. M., Al-khouja, M., Qin, S., Paniagua, D., & Corrigan, P. W. (2020). Honest, open, proud–college: Effectiveness of a peer-led small-group intervention for reducing the stigma of mental illness. *Stigma and Health, 5*(2), 168. https://doi.org/10.1037/sah0000185

Corona, K., Campos, B., & Chen, C. (2017). Familism is associated with psychological well-being and physical health: Main effects and stress-buffering effects. *Hispanic Journal of Behavioral Sciences, 39*(1), 46–65. https://doi.org/10.1177/0739986316671297

George, G., & Thomas, M. R. (2020). Quarantined effects and strategies of college students–COVID-19. *Asian Education and Development Studies*. https://doi.org/10.2196/21279

Ghaddar, S., Vatcheva, K. P., Alvarado, S. G., & Mykyta, L. (2020). Understanding the intention to use tel-ehealth services in underserved Hispanic border communities: Cross-sectional study. *Journal of Medical Internet Research, 22*(9), e21012. https://doi.org/10.2196/21012

Gonzales, S. M. (2019). Cultivating familismo: Belonging and inclusion in one Latina/o learning community. *International Journal of Inclusive Education, 23*(9), 937–949. https://doi.org/10.1080/13603116.2019.1602362

Hamza, C. A., Ewing, L., Heath, N. L., & Goldstein, A. L. (2021). When social isolation is nothing new: A longitudinal study on psychological distress during COVID-19 among university students with and without preexisting mental health concerns. *Canadian Psychology/psychologie Canadienne, 62*(1), 20. https://doi.org/10.1037/cap0000255

Harkness, A., Gattamorta, K. A., Estrada, Y., Jimenez, D., Kanamori, M., Prado, G., & Behar-Zusman, V. (2020). Latinx health disparities research during COVID-19: *Challenges and Innovations*. https://doi.org/10.1093/abm/kaaa054

Hasan, N., & Bao, Y. (2020). Impact of "e-Learning crack-up" perception on psychological distress among college students during COVID-19 pandemic: A mediating role of "fear of academic year loss." *Children and Youth Services Review, 118*, 105355. https://doi.org/10.1016/j.childyouth.2020.105355

Hyland, P., Shevlin, M., Murphy, J., McBride, O., Fox, R., Bondjers, K., Karatzias, T., Bentall, R. P., Martinez, A., & Vallières, F. (2021). A longitudinal assessment of depression and anxiety in the Republic of Ireland before and during the COVID-19 pandemic. *Psychiatry Research, 300*, 113905–113905. https://doi.org/10.1016/j.psychres.2021.113905

Katiria Perez, G., & Cruess, D. (2014). The impact of Familism on physical and mental health among Hispanics in the United States. *Health Psychology Review, 8*(1), 95–127. https://doi.org/10.1080/17437199.2011.569936

Khan, K. S., Mamun, M. A., Griffiths, M. D., & Ullah, I. (2020). The mental health impact of the COVID-19 pandemic across different cohorts. *International journal of mental health and addiction*, 1–7. https://doi.org/10.1007/s11469-020-00367-0

Kisely, S., Warren, N., McMahon, L., Dalais, C., Henry, I., & Siskind, D. (2020). Occurrence, prevention, and management of the psychological effects of emerging virus outbreaks on healthcare workers: rapid review and meta-analysis. *BMJ*, *369*. https://doi.org/10.1136/bmj.m1642

Kroenke, K., Spitzer, R. L., & Williams, J. B. (2001). The PHQ-9: Validity of a brief depression severity measure. *Journal of General Internal Medicine, 16*(9), 606–613. https://doi.org/10.1046/j.1525-1497.2001.016009606.x

Labrague, L. J., De los Santos, J. A. A., & Falguera, C. (2021). Social and emotional loneliness among college students during the COVID-19 pandemic: The predictive role of coping behaviours, social support, and personal resilience. *Perspectives in Psychiatric Care 57*(4), 1578–1584 https://doi.org/10.21203/rs.3.rs-93878/v2

Lee, S. A. (2020). Coronavirus Anxiety Scale: A brief mental health screener for COVID-19 related anxiety. *Death Studies, 44*(7), 393–401. https://doi.org/10.1080/07481187.2020.1748481

Lee, C. M., Juarez, M., Rae, G., Jones, L., Rodriguez, R. M., Davis, J. A., Boysen-Osborn, M., Kashima, K. J., Krane, N. K., & Kman, N. (2021). Anxiety, PTSD, and stressors in medical students during the initial peak of the COVID-19 pandemic. *PLoS ONE, 16*(7), e0255013. https://doi.org/10.1371/journal.pone.0255013

Liang, L., Gao, T., Ren, H., Cao, R., Qin, Z., Hu, Y., Li, C., & Mei, S. (2020). <? covid19?> Post-traumatic stress disorder and psychological distress in Chinese youths following the COVID-19 emergency. *Journal of Health Psychology, 25*(9), 1164–1175. https://doi.org/10.1177/1359105320937057

McGinn, M. M., Roussev, M. S., Shearer, E. M., McCann, R. A., Rojas, S. M., & Felker, B. L. (2019). Recommendations for using clinical video telehealth with patients at high risk for suicide. *Psychiatria Clinica, 42*(4), 587–595. https://doi.org/10.1016/j.psc.2019.08.009

Mulvaney-Day, N. E., Alegria, M., & Sribney, W. (2007). Social cohesion, social support, and health among Latinos in the United States. *Social Science & Medicine, 64*(2), 477–495. https://doi.org/10.1016/j.socscimed.2006.08.030

Paluszek, M. M., Landry, C. A., Taylor, S., & Asmundson, G. J. (2020). The psychological sequelae of the COVID-19 pandemic: Psychological processes, current research ventures, and preparing for a postpandemic world. *Behavior Therapy, 43*, 158–163. https://doi.org/10.1708/3382.33569

Pearce, K. (2020). What is social distancing and how can it slow the spread of COVID-19. *The Hub, Johns Hopkins University*. Retrieved February 15, 2022, from https://hub.jhu.edu/2020/03/13/what-is-social-distancing/

Ramírez de la Cruz, E. E., Grin, E. J., Sanabria-Pulido, P., Cravacuore, D., & Orellana, A. (2020). The transaction costs of government responses to the COVID-19 emergency in Latin America. *Public Administration Review, 80*(4), 683–695. https://doi.org/10.1111/puar.13259

Rivera, F. I. (2007). Contextualizing the experience of young Latino adults: Acculturation, social support and depression. *Journal of Immigrant and Minority Health, 9*(3), 237–244. https://doi.org/10.1007/s10903-006-9034-6

Russell, D., Peplau, L. A., & Ferguson, M. L. (1978). Developing a measure of loneliness. *Journal of Personality Assessment, 42*(3), 290–294. https://doi.org/10.1207/s15327752jpa4203_11

Sabogal, F., Marín, G., Otero-Sabogal, R., Marín, B. V., & Perez-Stable, E. J. (1987). Hispanic Familism and acculturation: What changes and what doesn't? *Hispanic Journal of Behavioral Sciences, 9*(4), 397–412. https://doi.org/10.1177/07399863870094003

Salehi, M., Amanat, M., Mohammadi, M., Salmanian, M., Rezaei, N., Saghazadeh, A., & Garakani, A. (2021). The prevalence of post-traumatic stress disorder related symptoms in Coronavirus outbreaks: A systematic-review and meta-analysis. *Journal of Affective Disorders*. https://doi.org/10.1016/j.jad.2020.12.188

Sánchez-Teruel, D., Robles-Bello, M. A., & Valencia-Naranjo, N. (2021). Do psychological strengths protect college students confined by COVID-19 to emotional distress? The role of gender. *Personality and Individual Differences, 171*, 110507. https://doi.org/10.1016/j.paid.2020.110507

Santabárbara, J., Lasheras, I., Lipnicki, D. M., Bueno-Notivol, J., Pérez-Moreno, M., López-Antón, R., De la Cámara, C., Lobo, A., & Gracia-García, P. (2021). Prevalence of anxiety in the COVID-19 pandemic: An updated meta-analysis of community-based studies. *Progress in Neuro-Psychopharmacology and Biological Psychiatry, 109*, 110207. https://doi.org/10.1016/j.pnpbp.2020.110207

Savitsky, Findling, Y., Ereli, A., & Hendel, T. (2020). Anxiety and coping strategies among nursing students during the covid-19 pandemic. *Nurse Education in Practice, 46*, 102809–102809. https://doi.org/10.1016/j.nepr.2020.102809

Sharma, D., & Bhaskar, S. (2020). Addressing the Covid-19 burden on medical education and training: The role of telemedicine and tele-education during and beyond the pandemic. *Frontiers in Public Health, 8*, 838. https://doi.org/10.3389/fpubh.2020.589669

Sheroun D, Wankhar DD, Devrani A et.al. A study to assess the perceived stress and coping strategies among B.Sc. nursing students of selected colleges in Pune during COVID-19 pandemic lockdown. *International Journal of Science & Healthcare Research*. 2020; 5(2): 280–288. https://ijshr.com/IJSHR_Vol.5_Issue.2_April2020/IJSHR0038.pdf

Sinclair, V. G., & Wallston, K. A. (2004). The development and psychometric evaluation of the Brief Resilient Coping Scale. *Assessment, 11*(1), 94–101. https://doi.org/10.1177/1073191103258144

Somma, A., Krueger, R. F., Markon, K. E., Gialdi, G., Colanino, M., Ferlito, D., Liotta, C., Frau, C., & Fossati, A. (2021). A longitudinal study on clinically relevant self-reported depression, anxiety and acute stress features among Italian community-dwelling adults during the COVID-19 related lockdown: Evidence of a predictive role for baseline dysfunctional personality dimensions. *Journal of Affective Disorders, 282*, 364–371. https://doi.org/10.1016/j.jad.2020.12.165

Talevi, D., Socci, V., Carai, M., Carnaghi, G., Faleri, S., Trebbi, E., di Bernardo, A., Capelli, F., & Pacitti, F. (2020). Mental health outcomes of the CoViD-19 pandemic. *Rivista Di Psichiatria, 55*(3), 137–144. https://doi.org/10.1708/3382.33569

Tasnim, R., Islam, M. S., Sujan, M. S. H., Sikder, M. T., & Potenza, M. N. (2020). Suicidal ideation among Bangladeshi university students early during the COVID-19 pandemic: Prevalence estimates and correlates. *Children and Youth Services Review, 119*, 105703. https://doi.org/10.1016/j.childyouth.2020.105703

Trnka, R., & Lorencova, R. (2020). Fear, anger, and media-induced trauma during the outbreak of COVID-19 in the Czech Republic. *Psychological Trauma: Theory, Research, Practice, and Policy, 12*(5), 546. https://doi.org/10.1037/tra0000675

UNESCO. (2020). *Education: From disruption to recovery.* Retrieved February 15, 2022, from https://en.unesco.org/covid19/educationresponse

Valdivieso-Mora, E., Peet, C. L., Garnier-Villarreal, M., Salazar-Villanea, M., & Johnson, D. K. (2016). A systematic review of the relationship between Familism and mental health outcomes in Latino population. *Frontiers in Psychology, 7*, 1632. https://doi.org/10.3389/fpsyg.2016.01632

Wang, Z.-H., Yang, H.-L., Yang, Y.-Q., Liu, D., Li, Z.-H., Zhang, X.-R., Zhang, Y.-J., Shen, D., Chen, P.-L., & Song, W.-Q. (2020). Prevalence of anxiety and depression symptom, and the demands for psychological knowledge and interventions in college students during COVID-19 epidemic: A large cross-sectional study. *Journal of Affective Disorders, 275*, 188–193. https://doi.org/10.1016/j.jad.2020.06.034

Weng, C. H., Saal, A., & Chan, P. A. (2020). High prevalence of SARS-CoV-2 infection among the uninsured Hispanic/Latino population: a retrospective cohort study. *Journal of General Internal Medicine: JGIM*. https://doi.org/10.1007/s11606-020-06026-3

World Health Organization. (2021). *Listings of WHO's response to COVID-19. 2020*. Retrieved Feb 15, 2022, from https://www.who.int/news/item/29-06-2020-covidtimeline

Yadav, R. K., Baral, S., Khatri, E., Pandey, S., Pandeya, P., Neupane, R., Yadav, D. K., Marahatta, S. B., Kaphle, H. P., & Poudyal, J. K. (2021). Anxiety and depression among health sciences students in home quarantine during the COVID-19 pandemic in selected provinces of Nepal. *Frontiers in Public Health* 580561–580561. https://doi.org/10.3389/fpubh.2021.580561

Zeng, B., Zhao, J., Zou, L., Yang, X., Zhang, X., Wang, W., Zhao, J., & Chen, J. (2018). Depressive symptoms, post-traumatic stress symptoms and suicide risk among graduate students: The mediating influence of emotional regulatory self-efficacy. *Psychiatry Research, 264*, 224–230. https://doi.org/10.1016/j.psychres.2018.03.022

Zimet, G. D., Dahlem, N. W., Zimet, S. G., & Farley, G. K. (1988). The multidimensional scale of perceived social support. *Journal of Personality Assessment, 52*(1), 30–41. https://doi.org/10.1207/s15327752jpa5201_2

Publisher's Note Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.

Authors and Affiliations

Andy Torres[1] · Amanda Palomin[1] · Frances Morales[1] · Maria Sevilla-Matos[1] · Cecilia Colunga-Rodríguez[2,3] · Mario Ángel-González[3] · Luis E. Sarabia-López[4] · Gabriel Dávalos-Picazo[5] · Diemen Delgado-García[1] · Daniel Duclos-Bastías[6] · Julio Cesar Vazquez-Colunga[3] · Claudia Liliana Vazquez-Juarez[3] · María Pilar Egea-Romero[5] · Alfonso Mercado[1,7]

[1]   Department of Psychological Science, The University of Texas Rio Grande Valley, 1201 W, University Dr, Edinburg, TX 78539, USA

[2]   Instituto Mexicano del Seguro Social (IMSS), Mexico City, Mexico

[3]   Universidad de Guadalajara, Guadalajara, Mexico

[4]   Universidad Central del Ecuador, Quito, Ecuador

[5]   Universidad CEU-San Pablo, Madrid, Spain

[6]   Escuela de Educación Física, Pontificia Universidad Católica de Valparaíso, Valparaíso, Chile

[7]   School of Medicine, Neurology and Psychiatry, The University of Texas Rio Grande Valley, Edinburg, USA