



Mental Health, Coping, and Social Support Among People Living with HIV in the Americas: A Comparative Study Between Argentina and the USA During the SARS-CoV-2 Pandemic

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Abstract

The COVID-19 pandemic poses a risk to mental health and may disproportionately affect people living with HIV (PLWH). This study examined the interaction of social support and resilient coping in predicting depressive symptoms among PLWH. PLWH residing in Buenos Aires, Argentina and in Miami, Florida (US) were asked to complete an anonymous survey on the impact of COVID-19. Statistical analysis included ordinary least squares regression. A total of 1,554 participants were included. Mean age was 47.30 years; 63.70% were men. A test of three-way interaction of social support × resilient coping × study site indicated differences by site ($b = -0.63$, $p = 0.04$, 95%CI $[-1.24, -0.02]$). In Argentina, higher levels of social support and resilient coping were associated with lower depressive symptoms. Lower levels of social support and resilient coping were associated with higher depressive symptoms. The impact of COVID-19 on mental health illustrates the need for developing innovative strategies to support resilience and to enhance coping with stress and adversity among PLWH.

Keywords Mental health · HIV · COVID-19 · Psychosocial burden

Resumen

La pandemia de COVID-19 presenta riesgos importantes para la salud mental y puede afectar desproporcionadamente a personas con VIH. Este estudio examinó el efecto entre el apoyo social y la resiliencia para afrontar situaciones difíciles en predecir síntomas depresivos en personas con VIH. Personas con VIH residentes de Buenos Aires (Argentina) y Miami, Florida (EE.UU) completaron una encuesta anónima sobre el impacto del COVID-19. El análisis estadístico incluyó un modelo clásico de regresión lineal con mínimos cuadrados ordinarios. Se incluyeron 1554 participantes. La edad promedio fue 47.30 años y 63.7% eran hombres. La prueba de interacción de apoyo social × resiliencia para hacer frente a situaciones difíciles × país indicó diferencias entre países ($b = -0.63$, $p = 0.043$, IC 95% $[1.24, -0.02]$). En Argentina, los participantes con mayor apoyo social y resiliencia para hacer frente a situaciones difíciles mostraron síntomas depresivos más bajos; y aquellos con menor apoyo social y resiliencia para hacer frente a situaciones difíciles, mostraron síntomas depresivos más

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altos. Este efecto no se observó en los participantes de Miami. El impacto de COVID-19 en la salud mental en personas con VIH ilustra la necesidad de desarrollar estrategias innovadoras para apoyar la resiliencia y mejorar el enfrentamiento del estrés y la adversidad.

Palabras Clave Salud mental · VIH · COVID-19 · Carga psicológica

Introduction

Since its first description in December 2019, SARS-CoV-2, the virus responsible for the coronavirus disease 2019 (COVID-19), has spread rapidly around the world and has caused over 34 million infections and 1.5 million deaths [1, 2]. The SARS-CoV-2 (COVID-19) pandemic is a global public health crisis posing numerous increasing health and economic challenges. At the time of this writing, October 2020, the epicenter of the pandemic lies in the Americas. Across continents, the response to the epidemic has varied from country to country [1]. In Argentina, the first case was diagnosed in March 2020 [3], and the government declared an enforced COVID-19 lockdown on March 20, 2020 [4], when there were 158 confirmed cases [5]. The lockdown extended over 4 months and resulted in slowing the progression of the epidemic in the country, with 903,730 total cases on October 12, 2020 [1, 3]. Conversely, the USA by March 2020 had already faced an exponential increase in laboratory-confirmed cases of COVID-19 and related deaths [6]. This surge led to many states and localities to issue stay-at-home orders, including orders for many nonessential businesses to close [7]. Today, after months of the initial outbreaks the epidemic continues to advance in both countries, placing them among the most affected nations by the COVID-19 pandemic in the Americas [1].

The first descriptions of the disease established that the infection could cause severe respiratory distress and illness [8, 9]. High-risk populations for severe forms included people ≥ 60 years, those of any age with underlying medical or chronic conditions, and those immunosuppressed (e.g., HIV, chronic lung disease, asthma, heart conditions, etc.) [10–12]. As such, people living with HIV (PLWH) are considered to be at greater risk for adverse outcomes due to COVID-19 [13–15]. Although recent retrospective analyses of hospitalized PLWH with COVID-19 do not appear to show higher rates of infection or severity among PLWH, the literature is scarce and lacks longitudinal follow up [16–18].

The COVID-19 pandemic represents an unprecedented public health threat, and mitigation strategies such as enforced lockdown and physical distancing combined with anxiety about potential infection, recently dubbed ‘coronaphobia,’ can have a profound impact on mental health [19]. In Argentina, adherence to restrictions have decreased lately, primarily due to its significant financial impact in a country with a fragile economy where more than 35% of the

population are living under the poverty line [20]. In the US, the economy has suffered its most severe contraction since the Great Depression, as more than 26 million people have filed for unemployment in March 2020. As a result, the US government approved a \$2.2 trillion economic stimulus bill to reactivate the economy. However, uncertainty regarding the eventual impact of the pandemic remains.

National surveys have described the mental health challenges of the population during the COVID-19 pandemic [21, 22]. Both surveys reported that the mental well-being of the general population has been adversely affected by COVID-19. Younger individuals, and racial and ethnic minorities were found to be disproportionately impacted. However, the long-term consequences of lockdown and economic disruption on mental health among PLWH around the world are unknown. Mental health, social support, and substance use are predictors of HIV-related health outcomes, including treatment adherence [23], and having a psychiatric diagnosis has been associated with increased mortality among patients hospitalized with COVID-19 [24].

Resilient coping has been found to buffer the negative impact of stressors on mental health [25]. Resilience-related factors such as social support and interpersonal resources have shown to be important for mitigating health challenges and stressful situations [26]. However, there is limited information on the use of strategies that could mitigate the impact of the pandemic on PLWH such as resilient coping and social support, and there have been no comparisons between nations affected by the pandemic in the Americas. Thus, this study examines the experiences of PLWH living in Argentina and the USA during the COVID-19 pandemic and explores the role of social support and resilient coping on mitigating the pandemic’s mental health impact.

Methods

Data collection for this cross-sectional study of PLWH in Argentina and the US was conducted during the first six months of mitigation of the SARS-CoV-2 pandemic (April–May 2020 in Argentina and April–September 2020 in the US). Following approval from the Institutional Review Boards (IRB) at the study sites, candidates were contacted regarding the study, provided with information on the study, and consented, before being administered or completing an adapted version of the Multicenter AIDS Cohort Study

(MACS)/Women’s Interagency HIV Study (WIHS) Combined Cohort Study (MACS/WIHS-CCS) [27] COVID-19 survey in English or Spanish. At the Argentinian site, the questionnaire was translated and adapted to Argentine Spanish by the Argentina team prior to administration and back translated by the US team. Individual study site procedures are described below.

Participants

Data from adults (> 18 years) PLWH receiving HIV care at the participating sites, were collected from collaborative studies located in Buenos Aires (Argentina) and Miami (USA).

Argentina

PLWH candidates were identified using the *Helios Salud* database, derived from information obtained as nongovernmental providers of HIV outpatient healthcare services for more than 10,000 PLWH residing mostly in Buenos Aires Metropolitan Area. Study staff contacted potential candidates via WhatsApp or email and notified candidates they could decline participation with no interference to their clinical services. The survey was self-administered and accessed through a web link using the REDCap© (Research Electronic Data Capture) [28] data capture platform. After creating the survey, it was sent to selected participants by WhatsApp or e-mail. Each message contained a description of the study and a unique, REDCap survey link that participants were able to complete at their convenience. Study staff did not confirm whether the link was functioning or not. Participants were not offered an incentive for completing the survey.

USA

PLWH candidates were identified through the Miami Center for HIV Research in Mental Health (CHARM)/Center for AIDS Research (CFAR) patient database and enrolled in the ACTION study (A Comprehensive Translational Initiative on Novel Coronavirus Cohort) which was approved by the University of Miami (UM) IRB prior to study start. Participants resided in Miami, Florida, a city with one of the highest numbers of HIV and SARS-CoV-2 infections in the US [29]. Due to local IRB regulations, participants in Miami could not be contacted by email or messaging app and were contacted by phone by the study personnel to explain the study. The survey was administered by phone by the study personnel or self-administered via a unique web link using REDCap© [28] if participants preferred. Participants were offered \$15 as an incentive for completing the survey.

Variables/Measures

The COVID Survey was adapted from the MACS/WIHS-CCS survey, which was developed to address the experience of individuals living with, or at risk for, HIV infection [30]. The survey included a total of 49 items and lasted 15–30 to complete. The survey included sociodemographics (e.g., age, sex, living arrangements), COVID-19 preventive behaviors and disruptions, psychosocial factors and mental health, including depression, perceived stress, loneliness, resilient coping, and social support [31–35].

Psychosocial Factors

We used a 10-item shortened scale version of the Center for Epidemiologic Studies Depression Scale (CES-D), previously used in PWH. Depression symptomatology measurements were retrieved from the questions: “I felt lonely,” “I felt depressed”, “I was bothered by things that don’t usually bother me,” “I have trouble keeping my mind of what I was doing,” “I felt uneasy,” “I felt fearful,” “I felt that everything I did was an effort,” “I could not get going,” “My worries overwhelmed me”, and “I was happy.” using responses on a 4-point Likert-type ordinal scale from 1 = Never to 4 = Always [31]. The reliability coefficients for both samples were in the acceptable range (Argentina: $\alpha = 0.83$; US $\alpha = 0.88$).

Perceived Stress included 4 items and was assessed using an adapted measure of the Perceived Stress Scale [32]. How often have you felt that: “Difficulties were piling up so high that I could not overcome them?” and, “you were unable to control the important things in life?” “things were going your way” “you were confident about your ability to handle your personal problems”. These items are rated on a 5-point Likert-type scale 1 = Never; 2 = Almost Never; 3 = Sometimes; 4 = Fairly Often; and 5 = Very often. The reliability coefficients for both samples were adequate (Argentina: $\alpha = 0.74$; US $\alpha = 0.78$).

Loneliness [31] included 3 items and was measured using a 3-point Likert-type scale from 1 = Hardly Ever 2 = Some of the time, and 3 = Often. Items included, “How often do you feel that you lack companionship?”, “How often do you feel isolated from others?”, and “How often do you feel left out?”. The sum of three items was used to calculate this score. Internal consistency in both samples was acceptable (Argentina: $\alpha = 0.67$; US $\alpha = 0.74$).

We defined resilient coping as the capacity of an individual to positively adapt and recover from adversities [36, 37]. It was measured by an adaptation of the Brief Resilient Coping Scale [38]. There were 3 items included asking “I look for creative ways to alter difficult situations”, “regardless of what happens to me, I believe I can control my reaction to it”, and “I believe I can grow in positive ways by

dealing with difficult situations”. A 5-point Likert scale was used for item responses (1 = Does not describe me at all, 2 = Does not describe me; 3 = Neutral; 4 = Describes me; 5 = Describes me very well). The sum of 3 items was used to calculate this score. Reliability in both samples was also acceptable for this scale (Argentina: $\alpha=0.77$; US $\alpha=0.73$).

Social support [35] included 2 items and was measured using a 5-point Likert scale ranging from 1 = Very Dissatisfied; 2 = Dissatisfied; 3 = Neutral; 4 = Satisfied; 5 = Very Satisfied (“In the last month, how satisfied are you with the social support that you have received from others?”).

Analytic Plan

Descriptive analyses included mean and standard deviation for key study variables. Analyses for multiple linear regression assumptions were carried out to ensure that none of the assumptions of linear regression modeling were violated. Comparisons by Argentina and USA were performed using t-tests, chi-square tests, or non-parametric alternatives. A three-way interaction of social support \times resilient coping \times study site predicting depressive symptoms was tested using the Model 2 PROCESS macro by Hayes for SPSS [39]. To prevent multicollinearity between variables, mean centering was performed on all variables. To establish statistical significance, a threshold cutoff value of $p < 0.05$ was applied. All statistical analyses were conducted using Statistical Package for the Social Sciences version 26.

Results

Demographic, COVID-19, Depression, and Psychosocial Variables

A total of 1,554 participants were included in the study, $n=1,336$ from Argentina and $n=218$ from the US. On average, participants were 47.30 (SD = 10.68) years old, and USA participants were older ($M=53.32$; SD = 10.88) compared to participants from Argentina ($M=46.32$; SD = 10.32; $t=2.62$, $p=0.009$). Two-thirds of participants were men, with a greater proportion of men in Argentina (67% versus 45%, $\chi^2=38.57$, $p < 0.001$). The majority of participants lived in their own home or apartment (82%), with a greater proportion in Argentina (83%) than the USA (76%; $\chi^2=5.01$, $p=0.025$).

With regards to COVID-19 preventive behaviors and disruption, there was high social distancing compliance reported but a greater proportion of participants reported practicing social distancing in Argentina (99%) than in the USA (95%) ($\chi^2=18.27$, $p < 0.001$). Rates of participants who quarantined due to having symptoms or an exposure were low. A greater proportion of participants in the USA

reported being quarantined due to COVID-19 symptoms (13% versus 2%, respectively; $\chi^2=85.54$, $p < 0.001$), contact with someone with COVID-19 (12% versus 1%; $\chi^2=111.30$, $p < 0.001$), or due uncertainty about whether they were positive for COVID-19 (12% versus 4%; $\chi^2=31.54$, $p < 0.001$). There was a greater proportion of participants who had lost a job or worked less hours due to COVID-19 in Argentina (62%) than in the USA (42%; $\chi^2=28.66$, $p < 0.001$), but a greater proportion of participants in the USA had difficulty paying for basic needs (66%) than in Argentina (59%; $\chi^2=4.07$, $p=0.04$).

Participants in the USA reported higher levels of depressive symptoms ($M=13.38$ [SD = 5.98] versus $M=12.78$ [SD=4.26], $t=3.31$ $p=0.001$), but higher levels of resilient coping ($M=11.88$ (SD=2.32) versus $M=11.32$ (SD=2.88), $t=2.70$, $p=0.007$) for depressive symptoms and resilient coping). Details on demographic, COVID-19, mental health, and psychosocial variables is described in Table 1.

Depressive Symptoms, Social Support, and Resilient Coping

A test of three-way interaction of social support \times resilient coping \times study site was shown to be significant, ($b=-0.63$, $p=0.043$, 95%CI [-1.24, -0.02]). In Argentina, higher levels of social support and resilient coping were associated with lower depressive symptoms. Lower levels of social support and resilient coping were associated with higher depressive symptoms. The three-way interaction is plotted in Fig. 1. Full details of the model are in Table 2.

Discussion

This study evaluated mental health and social support factors among PLWH in Argentina and the USA during the SARS-CoV-2 pandemic, and examined the interaction among depression, social support, and resilient coping. Results reveal that PLWH in the USA had higher levels of depression and resilient coping than those in Argentina. In Argentina, not in the US, social support and resilient coping contributed to lower levels of depression.

Directives to reduce the spread of SARS-CoV-2, such as national lockdowns and social distancing, pose significant wide-ranging effects on population mental health—particularly among vulnerable populations who may be more likely to comply. Previous studies have found that pandemics, including COVID-19, are associated with an increased risk of developing stress, depression, anxiety and loneliness [19, 40, 41], with up to 31% of people reporting at least one episode of depression related to the COVID-19 pandemic [21]. In addition, having mental health diagnoses is more common among PLWH [19], and

Table 1 Demographic, COVID-19, mental health and psychosocial variables

	All N= 1554 (%)	Argentina n= 1336 (%)	USA n= 218 (%)	$t/\chi^2, p$
<i>Demographic characteristics</i>				
Age	47.30 (10.68)	46.32 (10.32)	53.32 (10.88)	2.62, 0.009
	Range: 18–82	Range: 18–82	Range: 26–75	
	Mdn: 47.95	Mdn: 46.95	Mdn: 55.00	
Sex				
Female	564 (36.3)	444 (33.2)	120 (55.0)	
Male	990 (63.7)	892 (66.8)	98 (45.0)	38.57, <0.001
Living arrangements				
Own house/apartment	1268 (81.6)	1102 (82.5)	166 (76.1)	
Other	286 (18.4)	234 (17.5)	52 (23.9)	5.01, 0.025
<i>COVID-19 preventive measures and disruptions</i>				
Staying at home				
No	52 (3.3)	43 (3.2)	9 (4.1)	
Yes	1502 (96.7)	1293 (96.8)	209 (95.9)	0.48, 0.489
Practice social distancing				
No	22 (1.4)	12 (0.9)	10 (4.6)	
Yes	1532 (98.6)	1324 (99.1)	208 (95.4)	18.27, <0.001
Quarantined due to COVID-19 symptoms				
No	1505 (96.8)	1316 (98.5)	189 (86.7)	
Yes	49 (3.2)	20 (1.5)	29 (13.3)	85.54, <0.001
Quarantined due to contact with COVID-19				
No	1522 (97.9)	1329 (99.5)	193 (88.5)	
Yes	32 (2.1)	7 (0.5)	25 (11.5)	111.30, <0.001
Quarantined due to uncertainty of COVID-19 infection				
No	1479 (95.2)	1288 (96.4)	191 (87.6)	
Yes	75 (4.8)	48 (3.6)	27 (12.4)	31.54, <0.001
Self or others in household lost job or worked less hours due to COVID-19				
No	641 (41.2)	515 (38.5)	126 (57.8)	
Yes	913 (58.8)	821 (61.5)	82 (42.2)	28.66, <0.001
Difficulty paying basic needs due to COVID-19				
No	624 (40.2)	550 (41.2)	74 (33.9)	
Yes	930 (59.8)	786 (58.8)	144 (66.1)	4.07, 0.044
<i>Mental health and psychosocial variables</i>				
Depression	12.84 (4.56)	12.78 (4.26)	13.38 (5.98)	3.31, 0.001
Stress	8.27 (1.16)	8.28 (1.11)	8.19 (1.40)	0.84, 0.405
Loneliness	3.74 (3.77)	3.59 (1.17)	4.86 (1.91)	1.74, 0.082
Resilient coping	11.40 (2.81)	11.32 (2.88)	11.88 (2.32)	2.70, 0.007
Social support	4.02 (0.91)	4.00 (0.89)	4.16 (0.99)	1.75, 0.080

has been associated with increased mortality among hospitalized patients with COVID-19 [24]. This study found that PLWH have high levels of depression, loneliness, and low levels of social support, which may negatively impact their overall health and HIV outcomes. Thus, this could shed light on the effect of the regional pandemic among the vulnerable population of PLWH. However, the longer-term consequences on mental health are largely unknown and will need to be evaluated among PLWH and vulnerable populations.

Social support, an important predictor of resilient coping, may play an important role in buffering the impact of major life challenges on emotional distress and behavior, especially during the SARS-CoV-2 pandemic. It has been previously reported that among PLWH in Argentina, resilient coping strategies mitigated emotional distress and was hypothesized that strategies to developed resilience skills could facilitate coping with the effect of the coronavirus pandemic in this population [42]. However, this effect was not identified among the PLWH in the US population in this study. It is possible that this may have been influenced by

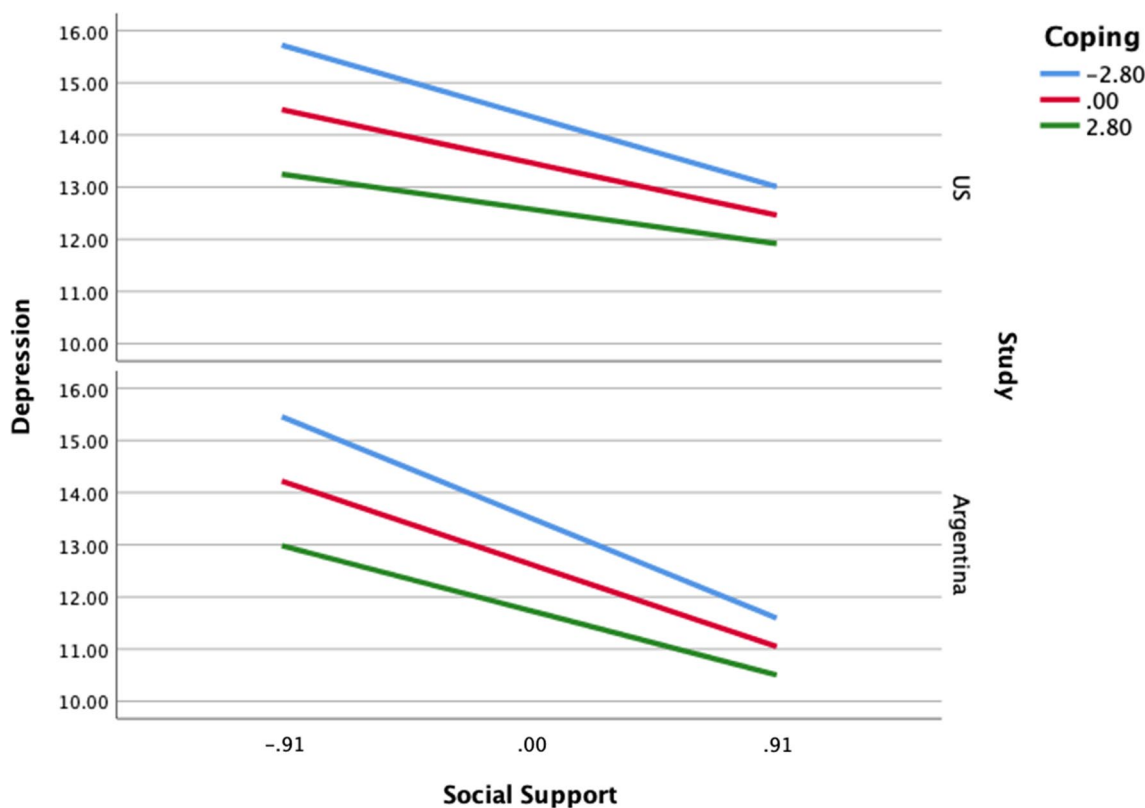


Fig. 1 Interaction of social support, resilient coping, and study site predicting depressive symptoms during the SARS-CoV-2 pandemic. The y-axis represents depressive symptoms. The x-axis (social support) represents ± 1 SD above/below the mean. Different colors represent different ± 1 SD levels of coping (blue = -1 SD below the mean; red = mean; green = +1 SD above the mean). A test of three-way

interaction of social support \times resilient coping \times study site was significant, $b = -0.63$, $p = .043$, 95% CI [-1.24, -0.02]. In Argentina, but not in the US, at high levels of social support and resilient coping, depressive symptoms were the lowest. At low levels of social support and resilient coping, depressive symptoms were the highest

Table 2 Depressive symptoms, social support, and resilient coping

Variable	<i>b</i>	SE	95% CI	<i>t</i>	<i>p</i>
Intercept	14.31	0.58	[13.17, 15.45]	24.66	<0.001
Social support	-0.48	0.58	[-1.62, 0.66]	-0.83	0.410
Coping	-0.32	0.04	[-0.39, -0.24]	-8.26	<0.001
Social support \times Coping	0.14	0.04	[0.06, 0.21]	3.48	0.001
Study (ref = Argentina)	-0.84	0.31	[-1.44, -0.24]	-2.74	0.006
Social support \times Resilient coping \times study Site	-0.63	0.31	[-1.24, -0.02]	-2.03	0.043

collectivistic values in Argentina, which likely place greater weight on social support from others. Individualistic values in the US may weaken the buffering effect of social support in the US sample. However, while, individualistic and collectivistic values were not assessed in this study, previous research contrasting US and Argentina on collectivistic and

individualistic values may support this.[43] A better understanding of how coping and social support relate to depression among PLWH in different regions may help to facilitate the implementation of regionally specific appropriate mental health treatment and support services.

The financial impact of the pandemic can be a risk factor for psychological disorders and poor health outcomes. [44, 45] Yet, Argentine PLWH in this study were able to cope and develop resilience in spite of widespread financial stress. It is conceivable that the severe economic crisis in Argentina in recent years has stimulated a greater adaptive response to job insecurity and financial hardship [46], or that financial assistance from the government during the pandemic has alleviated the stress due to financial burden [47]. In contrast, while PLWH in the US received financial assistance, many had higher levels of stress and depression. A previous study of people quarantined due to Ebola in Senegal found that, although participants received financial aid, some felt that the amount was inadequate, or it arrived too late; others felt that the help they received did not cover their continuing expenses [48]. As such, vulnerable individuals

in the USA who were quarantined and had low household income or income loss may need other support to manage pandemic-related stress and depression in addition to financial assistance.

As hypothesized, social support was negatively associated with depressive symptoms, and this effect was strengthened by resilient coping, which differed by region. In Argentina, depressive symptoms were the lowest when having high levels of social support and resilient coping, whereas in the US, though the association between depressive symptoms and social support was present, it was not strengthened by resilient coping. Though not measured in this study, cultural differences associated with nationality and levels of collectivism and individualism may have influenced the perception of stress and the benefit of resilient coping skills in each region. Social support and adaptive coping that be regarded differently in different cultural contexts [45]. Previous studies have found that Hispanics tend to have better resilient coping mechanisms than non-Hispanic due to a trajectory of overcoming stress through character traits, cultural values, and larger social support [49]. However, ethnicity was not assessed in our sample. Exploring cultural factors that promote resilience may enable a better understanding of the coping process, and with it, comprehensive interventions that maximize protective factors among the most vulnerable populations could be developed.

The primary limitations of this study include its cross-sectional design, which prevents causal inference. In addition, surveys were both online and self-reported and there is the potential of respondent bias. Furthermore, the comparisons between the countries may be influenced by the duration of the data collection period as well as the administration method (i.e., online versus telephone), which may have biased results. Finally, participants were primarily drawn from two cities in each country (Buenos Aires, Argentina, and Miami, Florida), which might limit the generalizability of the results. As the severity of the pandemic and the availability of medical services varies in each country, these findings may not represent the impact of the pandemic in other settings. Future research is needed to address the longitudinal effect of resilience and long-term outcomes.

This early study in the USA and Argentina suggests that resilient coping may act as a protective factor against the array of challenges and adversities associated with SARS-CoV-2 among PLWH. Previous studies have shown that resilience needs to be fostered early to prevent the development of depressive symptoms.[45] As PLWH are a vulnerable population already at higher risk of mental health burden and of severe COVID-19, understanding the drivers of COVID-19 infection in this population is pivotal for developing timely and effective public health interventions and mitigate risks.

Conclusion

The psychological impact of a pandemic for PLWH can be extensive and long lasting. Understanding the aspects of support that promote positive coping among vulnerable individuals living with HIV is important to supporting mental health and optimizing health outcomes. Initiatives are needed now to promote health and to empower PLWH with strategies to cope with stress and adversity.

Author's Contribution All authors had full access to all the data in the study and take responsibility for the accuracy and the integrity of the data analysis. MLA and DJ were responsible for study concept and design. All authors were responsible for data acquisition and interpretation of results. CU and VJR contributed with the data analyses. All authors were responsible for drafting and critical revision of the manuscript for important intellectual content.

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Data Availability The data underlying this article will be shared on reasonable request to the corresponding author.

Compliance with Ethical Standards

Conflict of interest MLA is currently receiving a grant (#P30AI073961) from the Miami Center for AIDS Research (CFAR). DLJ is currently receiving a grant (#P30MH116867) from the Clinic HIV/AIDS Registry of Miami (CHARMS). VJR was supported by a Ford Foundation Fellowship. For the remaining authors no competing interests were declared.

Informed Consent Informed consent was obtained from all individuals participants included in the study.

Ethical Approval The questionnaire and methodology for this study was approved by the Institutional Review Boards of the University of Miami and Helios Salud. This study was performed in accordance with the ethical standards as laid down in the 1964 Declaration of Helsinki.

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