

Original Article

# Social Media's Role on Hispanic College Students' Mental Health after the COVID-19 Pandemic: A Secondary Analysis

El Papel de las Redes Sociales en la Salud Mental de los Estudiantes Universitarios Hispanos después de la Pandemia de COVID-19: Un Análisis Secundario

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## ABSTRACT

This study investigates the effects of social media on the mental health of Puerto Rican college students after the COVID-19 pandemic, employing a cross-sectional survey from the University of Puerto Rico, Río Piedras Campus. Engaging 872 participants, it reveals that increased social media usage is weakly correlated with elevated levels of depression, anxiety, and stress. Furthermore, the findings indicate that social media may serve as a coping mechanism in response to restricted traditional social support during the pandemic. Additionally, the analysis uncovers gender-specific differences in social media use, with men showing stronger correlations between social media usage and depression and anxiety suggesting varying impacts across genders. Despite this, the direct link between social media and feelings of loneliness was not significant. Lastly, the study calls for further research to enhance the validity of these findings and recommends that universities develop educational and support strategies to mitigate the potential mental health risks linked to excessive social media use during challenging periods. Highlighting the complex role of social media in the psychological well-being of students, navigating pandemic-related disruptions.

**Keywords:** social media; COVID-19 pandemic; college students; mental health

## RESUMEN

Este estudio investiga los efectos de las redes sociales en la salud mental de los estudiantes universitarios puertorriqueños después de la pandemia de COVID-19, utilizando una encuesta transversal de la Universidad de

Puerto Rico, Recinto de Río Piedras. Al involucrar a 872 participantes, revela que el uso aumentado de redes sociales está débilmente correlacionado con niveles elevados de depresión, ansiedad y estrés. Los hallazgos indican que las redes sociales pueden servir como un mecanismo de afrontamiento en respuesta a la restricción del apoyo social tradicional durante la pandemia. Además, el análisis descubre diferencias específicas de género en el uso de redes, con los hombres mostrando correlaciones más fuertes entre el uso de redes sociales y la depresión y ansiedad, lo que sugiere impactos variados entre los géneros. A pesar de las tendencias generales, el vínculo directo entre las redes sociales y la soledad no fue significativo. El estudio pide más investigación para mejorar la validez de los hallazgos y recomienda que las universidades desarrollen estrategias educativas y de apoyo para mitigar los riesgos para la salud mental vinculados al uso excesivo de redes sociales durante períodos desafiantes.

**Palabras Claves:** redes sociales; pandemia COVID-19; estudiantes universitarios; salud mental

## INTRODUCTION

In March 2020, the World Health Organization declared a state of Pandemic due to the highly contagious SARS Coronavirus. World governments quickly introduced social distancing measures to mitigate the spread of the virus. The Puerto Rican government was among the strictest in enforcing lockdowns and curfews. Measures were taken due to fears of an imminent collapse of the already vulnerable healthcare system. Educational institutions were among the most affected, switching to online education, forcing students to alter their daily lives. Puerto Rican college students had to adapt to online learning and social distancing. These social disruptions, removal from social life, isolation, and confinement contributed to an increase in mental health problems among the already vulnerable college student population (Pandya & Loda, 2022). A recent meta-analysis by Wang et al. (2023) revealed high rates of anxiety (29%, 95% CI [19-25%]), depression (37%, 95% CI [32-42%]), and stress (23%, 95% CI [8-39%]) among college students during the Pandemic. Moreover, a longitudinal study conducted by Elmer et al. (2020) unveiled a significant rise in feelings of loneliness among college students during the COVID-19 pandemic compared to pre-pandemic levels. Additionally, findings from Gritsenko et al. (2020) support this trend, highlighting reports of heightened feelings of loneliness and social isolation among college students amidst the pandemic. These findings are particularly concerning for Puerto Rican students, given their heightened vulnerabilities stemming from past adversities such as major hurricanes and earthquakes.

According to recent literature, during difficult times such as this, many college students turned to

technology to cope with stress, anxiety, and negative emotions related to difficult situations (Cho et al., 2023). This behavior was more common during the Pandemic due to social distancing measures, online learning, and fear of contracting COVID (Eden et al., 2020). Social interactions were limited to online environments, compelling college students to rely on technology to connect with others. Several studies documented increased use of social media as a coping mechanism during the Pandemic (Parlak & Baskale, 2022). However, results on the effects of social media on mental health are inconclusive. A review of recent literature found that while certain research studies have indicated that social media platforms have the potential to facilitate connections, boost self-esteem, and enhance one's sense of belonging (Cho et al., 2023), they may also exert adverse effects, including heightened stress levels, an increased tendency to engage in social comparison (Zsila & Reyes, 2023). Moreover, there exists a noticeable gap in the literature concerning the impact of social media, specifically on Puerto Rican college students. This gap is particularly concerning given this demographic's challenges over the past five years. Factors such as economic instability, natural disasters, and social upheaval have likely intensified the intricate relationship between social media use and mental well-being within this population. As such, a deeper exploration of these dynamics is imperative to understand and address the unique challenges faced by Puerto Rican college students in the digital age.

### Effects of the Pandemic on College Students' Mental Health

Numerous articles have shed light on the prevalence of mental health issues among college students, revealing that these challenges were already a

recurring concern prior to the Pandemic. Studies and reports have consistently underscored the significant burden of mental health problems such as depression (Ahmad et al., 2018), anxiety (Ramón-Arbués et al., 2020; Beiter et al., 2015), stress (Dave et al., 2024), and loneliness (Zahedi et al., 2022) within the college student population. Factors such as academic pressure, social isolation, financial stress, and the transitional period into adulthood have long been acknowledged as significant contributors to the mental health challenges experienced by students (Mofatteh, 2020). In the context of Puerto Rican students, the most recent comprehensive study dates to 2013, when researchers identified elevated levels of depression among Puerto Rican college students (Reyes-Rodriguez, 2013). Regrettably, no subsequent study was found that specifically addressed the mental health of Puerto Rican college students in the post-pandemic era. This absence of recent research is particularly concerning, given the compounding effects of the Pandemic and other concurrent challenges on the mental well-being of Puerto Rican college students. The pandemic, along with pre-existing stressors such as economic instability, natural disasters, and social upheaval, may have exacerbated mental health issues within this population. Without updated data and targeted interventions, there is a risk of overlooking the unique needs of Puerto Rican college students and failing to provide adequate support during these unprecedented times.

### Social Media and Mental Health

Over the past two decades, there has been an exponential surge in social media usage worldwide, encompassing users of all age groups (O'Day & Heimberg, 2021). Platforms such as Facebook, Instagram, and Snapchat have facilitated connections across long distances and enabled interaction among individuals. According to surveys made worldwide as of January 2022, the Internet is being used by more than 4.95 billion people around the globe. Furthermore, approximately 4.62 billion people are active users of social media (Johnson, 2022; as cited in Sharma & Behl, 2022). According to recent studies, during the Pandemic, a growing number of students turned to social media to deal with the difficulties associated with social isolation, seek information, and connect with others. Social media provides college students solace during challenging times by allowing them to

connect with others and engage in digital environments (Pan et al., 2019).

Kardefelt-Winther's (2014) compensatory internet use theory sheds light on the motivations behind increased social media usage during the Pandemic. According to this model, negative situations can heighten individuals' motivation to seek solace and relief online. In response to challenging circumstances such as the COVID-19 pandemic, individuals may turn to the Internet, particularly social media, to alleviate negative emotions and seek connection. For example, a college student grappling with the challenges of social distancing, transitioning to online classes, and fear of COVID-19 may find solace in social media platforms. In addition, those who suffer from mental health issues like depression, anxiety, stress, and loneliness might spend additional time on social media to cope with negative feelings. They might use these platforms to connect with peers, share their frustrations, and seek emotional support from their social networks. By engaging in online interactions and expressing their thoughts and feelings, students can mitigate the negative impact of the pandemic on their mental well-being.

Although digital platforms and social media have long been considered mediums to communicate during social isolation, they have been seen as valid and effective tools for people to socialize and possibly relieve the concerns and symptoms caused by social distancing. However useful in socializing while being isolated, the excessive use of social media has been linked to anxiety, depression, self-injurious behavior, suicide risk and suicidal ideation, low levels of self-esteem, low school connectedness, and poor academic performance (Banyai et al., 2017; Espinoza & Juvonen, 2011; Keles et al., 2020; Monacis et al., 2020; Sampasa-Kanyinga et al., 2019; Shafi et al., 2019; Shensa et al., 2017). Some of these negative aspects of social media, such as anxiety, stress, and depression, are enhanced by the reinforcement of misinformation about the status of COVID-19 during the Pandemic (Kulkarni et al., 2020). Social media misinformation can spread fear and panic, undermining people's willingness to follow legitimate public health advice and proven precautionary measures (Thomas et al., 2018, as cited in Erku et al., 2021).

Social media's impact on mental health appears to be intricately tied to how individuals utilize these platforms. their investigation into social media usage

patterns, Verduyn et al. (2017) distinguished between active and passive forms of engagement. Active social media usage, which encompasses direct interactions with others, from personal communications to broader, non-targeted activities like streaming, is posited to enhance well-being. Conversely, passive usage, defined as non-interactive observation of others' activities, such as scrolling through feeds or viewing profiles, has been associated with diminished subjective well-being (Krasnova et al., 2015; Shaw et al., 2015; Tandoc et al., 2015). Notably, active participation in social media correlates positively with subjective well-being (Wenninger, Krasnova & Buxmann, 2014) and is inversely related to feelings of loneliness (Matook et al., 2015). Furthermore, such engagement is linked to a heightened sense of social capital (Burke et al., 2010).

An additional component to consider is gender roles in social media use. According to recent literature, gender roles, ingrained through varying socialization processes in people, lead to distinct skills and beliefs that manifest in differing social behaviors, including social media usage. In exploring this phenomenon, Kimbrough et al. (2013) observed that both genders tend to adhere to traditional gender roles in using social networking sites despite the inherent freedom of these platforms. Specifically, women have markedly increased their use of text-based communication, surpassing men in frequency and integration into daily interactions. This trend, deviating from previous research, suggests a preference among women for online video calls, indicating a primary use of technology for maintaining connections. Such findings underscore the evolving dynamics of gendered communication in digital spaces.

The intricate interplay between social media and college students' mental well-being, alongside a pressing need to comprehend gender role interactions, prompted researchers to undertake the current study. This research aims to investigate the correlation between social media usage and the levels of depression, anxiety, loneliness, and stress among Puerto Rican university students during the COVID-19 pandemic. Notably, a scarcity of recent studies addressing how social media engagement might influence the mental health outcomes of Hispanic students during this global crisis was observed. By addressing this research gap, the outcomes of these studies hold

the potential to make substantial contributions to the current body of literature. They will not only elucidate the intricate relationship between social media usage and the mental health of Hispanic college students but also underscore the significance of gender differences within these associations. This nuanced exploration enables researchers to gain deeper insights into the multifaceted ways college students utilize social media platforms and how these usage patterns intersect with their mental well-being.

**Table 1**  
*Participants sociodemographic data.*

Variable	n	%
<i>Sex</i>		
Female	658	74.18
Male	223	25.14
No Answer	6	0.68
<i>Origin</i>		
Puerto Rican	843	95.04
Other Hispanic	24	2.71
Dominican	5	0.56
Not Hispanic	5	0.56
Mexican	2	0.23
Cuban	1	0.11
No Answer	7	0.79
<i>Race</i>		
White	511	57.61
Black or African American	171	19.28
Non-White	22	2.48
No Answer	183	20.63
<i>Marital Status</i>		
Single	812	91.54
Married	40	4.51
Divorced or Widowed	5	0.56
No answer	30	3.38
<i>Yearly Income</i>		
\$0	235	26.49
\$1 - \$9,999	400	45.10
\$10,000 - \$24,999	131	14.77
\$25,000+	41	4.62
No Answer	80	9.02
<i>Employment Status</i>		
Employed	464	52.31
Unemployed	363	40.92
No Answer	60	6.76

## METHOD

### Research Design

The present study consists of a secondary data analysis from a cross-sectional, exploratory survey examining the impact of the quality-of-life changes during the late stages of the Pandemic on the mental health status of the students at the University of Puerto Rico, Río Piedras Campus.

## Participants

The sample of this study consisted of 872 participants, of which 74.18% identified as female, 25.14% as male, and 0.68% chose not to respond. Survey participants had an average age of 21.77 with a standard deviation of 5.22. The majority of participants (95%) indicated Puerto Rican origin. Regarding race, 58% of participants identified as White, 20% as Black, 2% as non-White, and 20% chose not to report their race. Concerning marital status, 95% of participants reported being single. Regarding employment, most participants stated they were employed and had an annual income of less than \$10,000. Descriptive statistics of the sample for this study are presented below (see table 1).

## Instruments

The fundamental variables and assessment tools employed in the study are delineated in the subsequent section. All measures were conducted in Spanish. For scales lacking preexisting Spanish versions, translations were performed using a simple translation that research team members revised.

**Daily Social Media Usage.** A section within the survey inquired about participants' engagement with social media platforms. Initially, participants were asked if they habitually utilize platforms such as Facebook, Instagram, and Snapchat. Those affirming their usage were subsequently queried about the typical duration spent on these platforms per day. The potential response options for participants regarding their average daily social media usage were categorized into five intervals: less than 2 hours, 2 to 3 hours, 4 to 6 hours, 7 to 12 hours, and more than 12 hours. To address the limited incidence of individuals spending over 12 hours on social media, the latter two categories were merged for analysis.

**Patient Health Questionnaire-9 (PHQ-9).** In this study, the 9-item depression module of the Patient Health Questionnaire (PHQ) was employed to assess depression symptoms. This instrument provides a concise, criterion-based evaluation of depression and its severity. PHQ-9 scores range from 0 to 27, with interpretations assigned to score intervals: 0-4 for minimal symptoms, 5-9 for mild symptoms, 10-14 for moderate symptoms, 15-19 for moderately severe symptoms, and 20 or above for severe depression symptoms. Internal consistency, as measured by

Cronbach's alpha, demonstrated good reliability for this study ( $\alpha = .86$ , 95% CI [.85, .87]).

**Generalized Anxiety Disorder-7 (GAD-7).** The GAD-7, a 7-item self-report scale, was utilized to assess symptoms indicative of generalized anxiety disorder. Items on this scale are rated on a four-point Likert scale, ranging from "not at all" (0) to "every day" (3). Scores between five and 10 points indicate mild GAD, 11 to 15 points signify moderate GAD, and scores exceeding 15 points suggest severe GAD. Internal consistency analysis using Cronbach's alpha indicated good reliability for this sample ( $\alpha = .89$ , 95% CI [.88, .90]).

**Perceived Stress Scale-10 (PSS).** The Perceived Stress Scale (PSS-10), developed by Cohen et al., was employed to measure perceived stress levels. This shortened version of the original 14-item scale has demonstrated robust psychometric properties in both English and Spanish-speaking populations. The PSS-10 consists of specific items from the PSS-14, rated on a scale from 0 to 4, with higher scores indicating greater perceived stress. Reverse scoring was applied to positively worded items. Remor (2006) adapted the Spanish version utilized in this study. Internal consistency analysis using Cronbach's alpha yielded satisfactory reliability ( $\alpha = .80$ , 95% CI [.78, .81]).

**Three-item loneliness scale (TILS).** The TILS instrument, developed by Hughes et al. (2004), comprises three items designed to measure feelings of loneliness. Participants respond to each item using a Likert scale ranging from 1 (hardly ever) to 3 (often), with higher scores indicating greater loneliness. The items assess perceived isolation, lack of companionship, and feelings of being left out. The TILS has demonstrated good reliability and validity in previous research, making it a widely used tool for assessing loneliness in various populations. Internal consistency analysis utilizing Cronbach's alpha revealed satisfactory reliability ( $\alpha = .81$ , [.79, .83]).

## General Procedures

The analysis performed for this study focused on the relationship time spent on social media had with the levels of stress, depression, and anxiety of college students in Puerto Rico. The survey consisted of 84 items and required approximately 16 minutes to complete (the survey was branched, so not all questions had to be answered). Recruitment of participants occurred on campus through the dissemination of

flyers, information stands, and verbal communication from April 23, 2022, to December 30, 2022. Additionally, outreach efforts were extended off campus via social media, email, and text messages. Data collection venues included university hallways, student lounge areas, and classrooms. Participants accessed the survey through a quick response code or a web link leading to the online form. Those who completed the survey were offered the chance to enter a giveaway for one of three Amazon gift cards valued at \$50 each as an incentive for their participation. Ethical approval for this study was obtained from the Institutional Review Board at the University of Puerto Rico, Rio Piedras Campus (Protocol #2022-084).

## RESULTS

### Correlation Analysis

Researchers conducted a Spearman correlation analysis to explore the relationship between daily social media usage among college students and levels of depression, generalized anxiety disorder (GAD), stress, and loneliness during the later stages of the Pandemic. To address the issue of multiple hypothesis testing, a Benjamini and Hochberg correction was applied to adjust the significance levels, providing a balanced approach to mitigate the risk of false negative errors in the results. The analysis was conducted on a sample of 683 individuals (189 cases were eliminated due to incomplete data) and revealed significant associations between daily social media usage and various mental health indicators. Specifically, weak positive correlations were observed between social media usage and levels of depression ( $\rho = 0.18$ , 95% CI [0.10, 0.25],  $p < .001$ ), as well as symptoms of generalized anxiety disorder (GAD) ( $\rho = 0.19$ , 95% CI [0.12, 0.26],  $p < .001$ ). These findings suggest that increased time spent on social media platforms may correlate with higher levels of depression and anxiety symptoms among individuals in the sample. Additionally, a positive correlation was found between social media usage and perceived stress ( $\rho = 0.14$ , 95% CI [0.07, 0.21],  $p < .001$ ), indicating that individuals who spent more time engaging with social media reported higher levels of perceived stress. Furthermore, a significant weak correlation was identified between loneliness and daily social media use ( $\rho = 0.10$ , 95% CI [0.02, 0.17],  $p = .04$ ), suggesting that as social media

use increases, so does loneliness among college students (see table 2).

**Table 2**  
*Correlations of mental health indicators with daily social media use*

Combination	<i>r</i>	95.00% CI	<i>n</i>	<i>p</i>	Corrected <i>p</i>
Depression	.18	[.11, .25]	683	< .001	< .001
Generalized Anxiety	.19	[.12, .26]	683	< .001	< .001
Stress	.14	[.07, .21]	683	< .001	< .001
Loneliness	.10	[.02, .17]	683	.010	.04

Note. Researchers performed Benjamini and Hochberg correction for multiple correlations.

Additional analyses were conducted to account for potential differences in social media practices by gender. Researchers conducted the same Spearman correlations split by sex. Results for female participants, after applying the Benjamini and Hochberg correction to adjust for multiple hypothesis testing, revealed significant positive correlations between social media usage and levels of depression ( $\rho = 0.14$ , 95% CI [0.05, 0.22],  $p = .008$ ), symptoms of generalized anxiety disorder (GAD) ( $\rho = 0.15$ , 95% CI [0.06, 0.23],  $p < .002$ ), and perceived stress ( $\rho = 0.10$ , 95% CI [0.01, 0.18],  $p = .038$ ) remained evident. These results are consistent with past group findings. However, no significant correlations were observed between social media usage and feelings of loneliness ( $\rho = 0.07$ , 95% CI [-0.02, 0.15],  $p = .13$ ), indicating that social media use might not be significantly related to these aspects of mental health among female participants in the study.

**Table 3**  
*Correlations of mental health indicators with daily social media use for female participants*

Combination	<i>r</i>	95.00% CI	<i>n</i>	<i>p</i>	Corrected <i>p</i>
Depression	.14	[.05, .22]	507	.002	.008
Generalized Anxiety	.15	[.06, .23]	507	< .001	< .002
Stress	.10	[.01, .18]	507	.025	.038
Loneliness	.07	[-.02, .15]	507	.128	.128

Note. Researchers performed Benjamini and Hochberg correction for multiple correlations.

The results of the Spearman correlations for male participants revealed significant associations between daily social media use and two prominent aspects of mental health: depression and generalized anxiety disorder (GAD). Specifically, a positive correlation was observed between social media usage and

levels of depression ( $r_{ho}= 0.24$ , 95% CI [0.09, 0.37],  $p= .008$ ), as well as symptoms of generalized anxiety disorder ( $r_{ho}= 0.25$ , 95% CI [0.11, 0.39],  $p= .002$ ). These results suggest that increased engagement with social media platforms may be linked to higher levels of depressive symptoms and heightened anxiety among individuals in our sample. However, no significant correlations were found between social media use and perceived stress ( $r_{ho}= 0.11$ , 95% CI [-0.04, 0.26],  $p= .143$ ), as well as feelings of loneliness ( $r_{ho}= 0.13$ , 95% CI [-0.02, 0.27],  $p= .098$ ).

**Table 4**

*Correlations of mental health indicators with daily social media use for male participants*

Combination	<i>r</i>	95.00% CI	<i>n</i>	<i>p</i>	Corrected <i>p</i>
Depression	.24	[.09, .37]	174	.002	0.008
Generalized Anxiety	.25	[.11, .39]	174	< .001	0.002
Stress	.11	[-.04, .26]	174	.143	0.143
Loneliness	.13	[-.02, .27]	174	.098	0.098

*Note.* Researchers performed Benjamini and Hochberg correction for multiple correlations.

## DISCUSSION

The present study aimed to investigate the relationship between daily social media usage and various mental health indicators among college students during the later stages of the pandemic. The results of the correlation analysis revealed that daily social media usage is associated with increased depression, anxiety, and loneliness scores. This finding is consistent with previous studies showing similar correlations between mental health indicators and social media use (Sun, 2023 & Ulvi et al., 2022). According to the compensatory model, these results suggest that individuals may turn to social media as a coping mechanism or means of seeking social support in response to heightened feelings of depression, anxiety, or loneliness. Many college students might be using social media as a way to deal with negative emotions and feelings arising during the pandemic. As traditional sources of support and social interaction became constrained by public health measures, the digital sphere emerged as a refuge for seeking solace, camaraderie, and validation.

These findings underscore the importance of developing support services for college students so that they don't have to rely solely on social media or internet platforms to cope with negative emotions and

feelings. The results of this study also explored if there were gender differences in the correlations between daily social media usage and mental health indicators. Similar to group findings, depression, and anxiety both positively correlated with social media usage. Stress significantly correlated with social media usage for women but not for men.

In line with prior research (Barker, 2009; Hogue & Mills, 2019; Krasnova et al., 2017; Muscanell & Guadagno, 2012), our findings suggest that women tend to exhibit greater motivation for utilizing social media platforms to maintain already established close relationships, gain social details, communicate with friends, and view others' photos. These behaviors might have helped them cope with negative feelings during the pandemic. Connecting through online pages allowed women to connect with family and friends during social isolation.

Unlike men, who use social media to establish new relationships, gain general information, and play online games (Krasnova et al., 2017; Lin et al., 2017). Finally, no significant correlation was found for loneliness and social media use for men and women. These results underscore the importance of understanding gender differences related to social media use. In addition, it calls for universities to update their mental health services in these difficult times so students do not have to rely on digital platforms to deal with mental health problems.

This analysis's main limitations are related to the main research, sampling strategies and survey design. This study examined a nonrepresentative sample recruited through convenience sampling, limiting the results' generalizability to the student population of the University of Puerto Rico, Rio Piedras campus, let alone the entire system comprising 11 campuses across the main island. The survey lacked items related to the usage of specific social media platforms and how participants engaged with said platforms. None of the measures used for this analysis posed a language barrier. However, the Spanish version of the PSS-10 was translated into Castilian Spanish, which is not generally spoken by the Puerto Rican population. Future research on college students' social media use and its impact on mental health should adopt a broader, more diverse approach by including random sampling across various campuses, including private universities.

## CONCLUSION

The results of this study highlight the significant associations between social media usage and various mental health variables. It's imperative to recognize the profound impact of social media on college students, as many continue to turn to these platforms as a temporary means of alleviating symptoms of depression, stress, loneliness, and anxiety. While social media may offer a momentary respite from these mental health challenges, it's crucial for college and mental health services to educate students about the potential positive and negative effects of prolonged social media use. Empowering students with information about the potential risks associated with excessive social media usage is essential. While these platforms may provide temporary relief, relying solely on them for coping mechanisms can have detrimental effects in the long run. Therefore, it's essential to encourage students to seek appropriate mental health services and support systems instead of solely relying on social media as a temporary escape. Orienting students about the importance of seeking professional help and providing access to mental health services, colleges can play a pivotal role in promoting the holistic well-being of their students. Moreover, fostering a culture of open dialogue surrounding mental health and social media usage can help destigmatize seeking help and encourage students to prioritize their mental health needs over temporary solutions provided by social media platforms.

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**Approval of the Institutional Board for the Protection of Human Subjects in Research:** This study was approved by the Institutional Review Board of University of Puerto Rico, Río Piedras Campus (Protocol #2022-084).

**Informed Consent:** All participants completed an informed consent form.

**Review Process:** This study has been reviewed by external peers in double-blind mode.

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