



Adverse Childhood Experiences and Lifetime Suicide Attempts among High-Risk Latine Individuals Entering Behavioral Health Treatment

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Abstract

The relationship between adverse childhood experiences (ACEs) and lifetime suicide attempts among high-risk Latine remains underexplored. This study examined the understudied intersections of ACEs, Latine ethnicity, and lifetime suicide attempts among high-risk individuals entering behavioral health treatment. This secondary analysis involved 299 Latine adults entering integrated behavioral health treatment. A multivariate logistic regression analysis was conducted to assess ACE scores and lifetime suicide attempts, controlling for social drivers of health such as housing, employment, and education. Key findings show that 28% of the sample reported lifetime suicide attempts. Multivariate analysis found that for every unit increase in ACE scores, the odds of lifetime suicide attempts increased by 21% ($OR=1.21$, 95% CI [1.07, 1.38]). Additionally, those who reported being unemployed were 2.39 times more likely to have attempted suicide in their lifetime compared to their counterparts, and those who self-identified as Puerto Rican were 2.04 times more likely to report a lifetime suicide attempt. This study underscores the importance of screening for ACEs and providing services such as employment training, trauma-informed care, and suicide prevention services to Latine individuals, especially those who identify as Puerto Rican. Additional research needs to be conducted on the effects of colonization on the health and mental health of individuals of Puerto Rican descent.

Keywords Adverse childhood experiences · Lifetime suicide attempt · Intersectionality · Social drivers of health · Colonization · High-risk and latine ethnicity

Introduction

Suicide is a major public health crisis and the 11th leading cause of death in the United States [1]. In 2023, an estimated 49,316 individuals died by suicide [2], whereas

approximately 12.8 million experienced suicidal ideation, 3.7 million made a suicide plan, and 1.5 million attempted suicide [3]. Historically, suicide rates have been higher among non-Latine White individuals compared to non-Latine Black and Latine individuals (this study uses the

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term “Latine” as a gender-neutral alternative for individuals who identify as Hispanic or Latino/a/x). However, in recent decades, suicide rates have significantly risen among non-Latine Black and Latine individuals [4]. More specifically, among Latines, suicide rates increased by 29% from 2012 to 2020, with the rate rising from 5.8 to 7.5 per 100,000 individuals [5]. A well-documented risk factor for suicide is having previously attempted suicide [6]. Among Latine subgroups, suicide attempts are more common among Puerto Ricans than other Latine groups in the United States [7]. Specifically, among Puerto Ricans, risk factors for suicide attempts include acculturation, depression, anxiety disorders, unemployment, and substance use disorders [8, 9]. A growing body of research has suggested that a history of adverse childhood experiences (ACEs) is also a risk factor for suicide attempts [10, 11].

ACEs are defined as traumatic events that occur during an individual’s childhood, specifically before age 18 [12]. Such experiences include abuse, neglect, sexual abuse, and a range of household dysfunctions (alcohol and substance use, divorce or separation of parents or caregivers, domestic violence, mental illness, and criminal behavior) [13]. ACEs can have serious long-term negative consequences that may arise later in life. These experiences can affect an individual’s mental health, leading to anxiety [14], depression [15], and substance use disorders [10, 11], along with physical health challenges such as cardiovascular disease, obesity, and cancer [16].

Crenshaw [17] coined the term “intersectionality theory,” which acknowledges that social identities such as race, gender, class, sexuality, and power structures are interconnected and shape unique experiences of oppression [18, 19]. Intersectionality theory highlights how the interplay of race and ethnicity with power structures influences individuals’ behavioral health outcomes. This study used intersectionality theory because it is relevant to understanding social identities and related forms of oppression and privilege [19]. Understanding Latine intersectionality and the heterogeneity of subgroups allows us to recognize how race and ethnicity shape each subgroup’s experiences, challenges, and opportunities. Latine individuals are disproportionately more affected by ACEs than their non-Latine White counterparts [20]. Latine individuals are more likely to have experienced one or multiple ACEs due to their higher rates of poverty, parental incarceration, and exposure to family violence [21, 22], which can result in increased levels of psychological distress, such as depression, anxiety, and nervousness [22, 23]. Studies have also found that Latine individuals with a history of ACEs are more likely to engage in marijuana use, cigarette smoking, binge drinking, and hard

drug consumption compared to individuals from other racial and ethnic backgrounds [24–26].

Latine individuals born in or outside the United States are more likely to experience higher rates of mental health distress and ACEs while residing in the United States compared to in their homeland [27, 28]. A growing body of research has found that social health drivers such as poverty, housing instability, limited access to healthcare, and unemployment can increase the risk of experiencing trauma and suicide attempts [7, 29]. Many Latine individuals face significant barriers to accessing mental health care, such as language barriers, cultural stigma surrounding mental health issues, a shortage of culturally competent providers, and inadequate insurance coverage [27, 30–32]. As a result, these challenges can lead to a greater reliance on substances as a coping mechanism, which increases the risk of suicide attempts [33]. Moreover, studies have suggested that ACEs are extensive among Puerto Ricans and associated with the country’s sociopolitical history and racial and socioeconomic inequalities stemming from a legacy of colonialism [34, 35]. Furthermore, factors such as acculturation stress, intergenerational trauma, and discrimination may be associated with Puerto Ricans’ higher risk of suicide attempts compared to other Latine ethnicities [36, 37].

Despite numerous studies that have examined ACEs and suicide attempts [33, 38], there remains a need to explore the intersections of Latine ethnicity, ACEs, and lifetime suicide attempts. Further, there is limited information regarding ACE scores and lifetime suicide attempts among high-risk Latine individuals with behavioral health challenges who are seeking treatment. This study aimed to fill this gap by examining the relationship between history of ACEs and lifetime suicide attempts in a group of high-risk Latine adults seeking behavioral health treatment.

Method

Study Setting and Program Services

The present study involved a secondary data analysis conducted as part of a program evaluation at Casa Esperanza, Inc. Casa is a bilingual and bicultural behavioral health center that specializes in providing a continuum of comprehensive behavioral health, primary care, and support services in Spanish and English to the Latine community in Massachusetts. Their mission is to empower individuals and families to recover from addiction trauma, mental illness, and other chronic medical conditions; to overcome homelessness; and achieve health and wellness through

comprehensive, integrated care. Responding to the need to address social determinants of health, Casa offers community support programs that include job training, employment support, educational referrals, housing assistance, and reentry support. Many of Casa's staff members are bilingual and bicultural. More detailed information about Casa Esperanza and its services can be found in other publications [7, 26].

Design and Sample

The present secondary data analysis used intake and assessment data from client interviews conducted between January 2020 and December 2022. The sample consisted of 299 Latine adults aged 18 years or older who completed assessment data at the intake visit. As a requirement of the Substance Abuse and Mental Health Services Administration (SAMHSA), all clients entering the program completed the Government Performance and Results Act and National Outcome Measures [39]. Casa also used other validated behavioral health and health scales and assessment tools, such as the 9-item Patient Health Questionnaire [40] and the 7-item Generalized Anxiety Disorder scale [41]. All analyzed variables were taken from these measures. Before the start of each interview, program staff members built rapport with the clients, given the sensitive and personal nature of the questions. Once rapport was established and the client signed an informed consent form, they were interviewed by a bilingual interviewer who conducted the initial assessment in English or Spanish. Staff members read the standardized questions, and the client noted their response. This study was approved and received exempt status from the University of Denver Institutional Review Board. The study received exempt status because the purpose of SAMHSA grants is the delivery of services and evaluation of processes and outcomes. Client data were collected by the organization to report to SAMHSA, be used by the clinical staff, and provide aggregated, anonymized data to program evaluators. We conducted a secondary analysis of these existing data, and our study therefore received exempt status.

Measures

Outcome Variable

The outcome variable was lifetime suicide attempt. Respondents were asked the following question: "Have you ever in your lifetime attempted suicide?" Responses were coded as "no" and "yes."

Main Explanatory Variables

The explanatory variable of interest was ACEs, measured using the original Centers for Disease Control and Prevention and Kaiser ACE Scale (Wave 2), a 10-item questionnaire [13, 42]. Participants responded "no" or "yes" to questions that assessed childhood personal or family history of abuse, neglect, divorce, intimate partner violence, prison, mental health issues, and substance abuse problems. More detailed information about the exact wording of the questionnaire is provided in Table 1. The ACE score measure was summative, with one point for each affirmative answer, for a maximum score of 10. In the present study, Cronbach's alpha for these 10 items indicated a moderate level of internal consistency ($\alpha = 0.64$) [43]. Additionally, as part of our sensitivity analyses, we created a dummy variable indicating if the participants reported four or more ACEs versus fewer than four. Prior research has found that individuals with four or more ACEs are at higher risk of negative health outcomes than those with no ACEs [16]. Therefore, a threshold of four is recommended [16, 44].

The second explanatory variable of interest was Latine ethnicity. We could only define Latine ethnicities as Puerto Rican or other Latine ethnicity.

Table 1 ACE questionnaire items

1. Did a parent or other adult in the household often swear at you, insult you, put you down, or humiliate you? Or act in a way that made you afraid that you might be physically hurt?
2. Did a parent or other adult in the household often push, grab, slap, or throw something at you? Or ever hit you so hard that you had marks or were injured?
3. Did an adult or person at least 5 years older than you ever touch or fondle you or have you touch their body in a sexual way? Or try to or actually have oral, anal, or vaginal sex with you?
4. Did you often feel that no one in your family loved you or thought you were important or special? Or your family didn't look out for each other, feel close to each other, or support each other?
5. Did you often feel that you didn't have enough to eat, had to wear dirty clothes, and had no one to protect you? Your parents were too drunk or high to take care of you or take you to the doctor if you needed it?
6. Were your parents ever separated or divorced?
7. Was your mother or stepmother often pushed, grabbed, slapped, or had something thrown at her? Or sometimes or often kicked, bitten, hit with a fist, or hit with something hard? Or ever repeatedly hit over at least a few minutes or threatened with a gun or knife?
8. Did you live with anyone who was a problem drinker or alcoholic or who used street drugs?
9. Was a household member depressed or mentally ill or did a household member attempt suicide?
10. Did a household member go to prison?

Covariates

The covariates were variables measuring social drivers of health associated with lifetime suicide attempts. Specifically, age was measured in years; gender was coded as a binary variable: male and female. Participants were also asked about social determinants of health. First, they were asked, “In the past 30 days, how many nights have you been homeless in a shelter, on the streets, in a vehicle, or outdoors?” Response options were 0 nights, 10 nights, 15 nights, 20 nights, 23 nights, 26 nights, 29 nights, and 30 nights. Participants who were housed were coded as 0, whereas those who were homeless for at least one night or more were coded as 1. They were asked, “Are you currently employed?” (yes/no). The third question, addressing sexual orientation, was, “Which one of the following do you consider yourself to be?” Participants who self-identified as lesbian, gay, or bisexual were coded as 1, and those who self-identified as heterosexual were coded as 0. Fourth, they were asked, “What is your highest level of education you have completed?” Response options included less than a high school education, a high school graduate or equivalent, and at least some college or vocational or technical training. Participants were asked the following questions about their substance use and mental health: (a) “How many years in your lifetime have you used cocaine or crack?” (b) “How many years in your lifetime have you used heroin?” (c) “In the past 30 days, not due to alcohol or drug use, how many days have you experienced serious depression?” (d) “In the past 30 days, not due to alcohol or drug use, how many days have you experienced anxiety or tension?” Substance use and mental health symptoms were coded based on the number provided by respondents, beginning with zero for those who had never used substances and did not experience mental health symptoms. Current behavioral health diagnoses based on electronic medical records were coded as follows: substance use disorder, mental health disorder, and co-occurring disorders (i.e., diagnosed with both).

Data Analysis

Data were analyzed using descriptive, bivariate, and multivariate techniques. First, descriptive statistics were performed to examine the study’s general distribution of all variables included in the analysis. Second, we used independent *t*-tests and Pearson’s chi-square tests to examine the bivariate associations between ACEs and lifetime suicide attempts. Independent *t*-tests were used to compare continuous variables between groups, whereas Pearson’s chi-square tests were used to test categorical variables. Finally, only variables that were significant at the bivariate level were entered into the multivariate logistic regression. The

main analysis involved using multivariate logistic regression while controlling for the effects of the covariates. Additionally, to address differences in cocaine use noted between Puerto Rican and Other Latine respondents, we extended the model to analyze the effects associated with cocaine use separately for the Puerto Rican group and the Other Latine group. Lifetime cocaine use was centered in the Puerto Rican group and separately in the Other Latine group. Group-specific terms were calculated by multiplying Puerto Rican or Other Latine indicator variables by the corresponding group-centered cocaine use. Furthermore, Other Latine were set as the reference category. The coefficient for Puerto Rican ethnicity indicated the difference in the log-odds of the outcome between Puerto Ricans and Other Latine when comparing individuals with the average level of cocaine use in each group. The term for Puerto Rican group-centered cocaine use assessed the effect of a 1-unit increase in cocaine use among Puerto Ricans. Equally, the term for Other Latine group-centered cocaine use assessed the effect among Other Latine. This allowed identification of elevated risk associated with Puerto Rican identity while allowing the possibility that some of that elevated risk may be due to higher average cocaine use. The results were reported in odds ratios (ORs) with 95% confidence intervals (CIs). All analyses were performed using SPSS software version 27, and variables were considered significant if the *p*-value was less than 0.05.

Results

Sample Characteristics

Table 2 displays the general distribution of the variables analyzed in the study. Roughly one third (28.4%) of the sample reported a suicide attempt during their lifetime. The mean age was 42.7 years (*SD*=11.8), roughly two thirds of the sample (66.2%) were male, and almost all participants identified as heterosexual (96.3%). About half (48.5%) of the sample identified as Puerto Rican. Many clients were unemployed (81.3%), and half (50.5%) were unhoused at intake. About two thirds (68.2%) of the sample were diagnosed with a co-occurring disorder. Additionally, 1 in 5 (22.1%) were diagnosed with a mental health disorder only, whereas 1 in 10 (9.7%) were diagnosed with a substance use disorder only. Additionally, Latine clients reported that their average number of years of cocaine use was 6.4 (*SD*=9.8), whereas the average number of years for heroin use was 5.3 (*SD*=9.3). Finally, clients reported an average number of days experiencing symptoms of serious depression of 14.0 (*SD*=9.7), and the average number of days experiencing serious anxiety or tension was 10.8 (*SD*=9.8) in the past 30

Table 2 Sample characteristics ($N=299$)

Variable	<i>n</i> (%)	<i>M</i> (<i>SD</i>)
Outcome variable		
Lifetime suicide attempt		
No	214 (71.6)	
Yes	85 (28.4)	
Main explanatory variables		
ACEs score		4.2 (2.3)
0–3	112 (38.0)	
4–10	183 (62.0)	
Latine ethnicity		
Other Latine	154 (51.5)	
Puerto Ricans	145 (48.5)	
Control variables		
Age (years)		42.7 (11.8)
Sex		
Male	198 (66.2)	
Female	101 (33.8)	
Sexual orientation		
Heterosexual	285 (96.3)	
Lesbian, gay, or bisexual	11 (3.7)	
Education level		
Less than high school	160 (53.5)	
High school graduate or equivalent	84 (28.1)	
At least some college or vocational school	55 (18.4)	
Employment status		
No	243 (81.3)	
Yes	56 (18.7)	
Housing status (30 days)		
Housed	151 (50.5)	
Homeless	148 (49.5)	
Diagnosis		
Substance use disorder	29 (9.7)	
Mental health disorder	66 (22.1)	
Co-occurring disorder	204 (68.2)	
Substance use		
Lifetime cocaine use (years)		6.4 (9.8)
Lifetime heroin use (years)		5.3 (9.3)
Mental health		
Serious depression (30 days)		14.0 (9.7)
Serious anxiety (30 days)		10.8 (9.8)

days. The mean ACE score was 4.2 ($SD=2.3$). Table 3 displays the ACEs questionnaire items and the corresponding “yes” responses for each item.

Bivariate Association between ACEs and Lifetime Suicide Attempts

Table 4 shows the bivariate association between ACEs and lifetime suicide attempts. About 48.2% of those who experienced sexual abuse reported a lifetime suicide attempt compared to 23.4% who did not report experiencing sexual abuse, $\chi^2(2) = 13.01, p < .001$. Roughly 1 in 3 (35.2%) Latines who experienced emotional abuse reported a lifetime

Table 3 Sample characteristics: exposure to aces ($N=297$)

ACE	Full Sample <i>n</i> (%)	Other Latine <i>N</i> =153 <i>n</i> (%)	Puerto Ricans <i>N</i> =144 <i>n</i> (%)
Abuse			
Emotional abuse	128 (43.1)	70 (45.8)	58 (40.3)
Physical abuse	113 (38.0)	59 (38.6)	54 (37.5)
Sexual abuse	58 (19.5)	30 (19.6)	28 (19.4)
Neglect			
Emotional neglect	119 (40.2)	59 (38.8)	60 (41.7)
Physical neglect	137 (46.1)	70 (45.8)	67 (46.5)
Household dysfunction			
Parental separation or divorce	183 (61.8)	82 (53.9)	101 (70.1)
Domestic violence	43 (14.5)	20 (13.1)	23 (16.0)
Household member substance misuse	173 (58.2)	78 (51.0)	95 (66.0)
Household member mental disorder	159 (53.5)	70 (45.8)	89 (61.8)
Incarcerated household member	144 (48.5)	52 (34.0)	92 (63.9)

suicide attempt, compared to 1 in 4 (23.1%) who did not report emotional abuse, $\chi^2(2) = 4.66, p = .031$. Additionally, about 35.4% of those who experienced physical abuse reported a lifetime suicide attempt, compared to 23.9% who did not report physical abuse, $\chi^2(2) = 4.00, p = .045$. Finally, approximately 1 in 3 (35.4%) who experienced having an incarcerated household member reported a lifetime suicide attempt, compared to 1 in 4 (21.6%) who did not have an incarcerated household member, $\chi^2(2) = 6.35, p = .012$.

Bivariate Association between all Study Variables and Lifetime Suicide Attempts

As described in Table 5, roughly 1 in 3 (35.5%) Latines with an ACEs score of four or more reported a lifetime suicide attempt, compared to 16.1% who did not report having a score of less than four, $\chi^2(2) = 12.05, p < .001$. Additionally, 1 in 3 (35.2%) Latines who identified as Puerto Rican reported a lifetime suicide attempt, compared to 1 in 5 (22.1%) who did not identify as Puerto Rican, $\chi^2(2) = 5.67, p = .017$. Finally, 1 in 3 (31.7%) Latine adults who were unemployed reported a lifetime suicide attempt, compared to 14.3% of those who were employed, $\chi^2(2) = 5.95, p = .015$.

For continuous variables, an independent *t*-test was conducted to compare mean differences between Latine adults who had or had not attempted suicide in their lifetime. We found that Latine adults with a lifetime history of suicide attempt had higher ACE scores compared to Latine adults without an attempt (mean difference = 1.33, 95% CI [1.90, 0.76]). Some Latine adults with a lifetime history of

Table 4 Bivariate association between exposure to aces and lifetime suicide attempt ($N=297$)

Variables	Lifetime Suicide Attempt		
	No	Yes	
	%	%	χ^2
Emotional abuse			4.66 ($p=.031$)
No	76.9	23.1	
Yes	64.8	35.2	
Physical abuse			4.00 ($p=.045$)
No	76.1	23.9	
Yes	64.6	35.4	
Sexual abuse			13.01 ($p<.001$)
No	76.6	23.4	
Yes	51.7	48.3	
Emotional neglect			0.962 ($p=.327$)
No	68.1	31.9	
Yes	74.0	26.0	
Physical neglect			3.05 ($p=.081$)
No	76.3	23.8	
Yes	66.4	33.6	
Parental separation or divorce			3.66 ($p=.056$)
No	78.8	21.2	
Yes	67.8	32.2	
Domestic Violence			1.49 ($p=.222$)
No	73.2	26.8	
Yes	62.8	37.2	
Household member substance misuse			2.12 ($p=.146$)
No	76.6	23.4	
Yes	68.2	31.8	
Household member mental disorder			10.48 ($p<.001$)
No	81.2	18.8	
Yes	63.5	36.5	
Incarcerated household member			6.35 ($p=.012$)
No	78.4	21.6	
Yes	64.6	35.4	

suicide attempt reported significantly more years of lifetime cocaine use compared to those without an attempt (mean difference=4.59, 95% CI [7.37, 1.81]). Finally, Latine adults with a lifetime history of suicide attempt reported significantly more days of anxiety or tension (mean difference=4.38, 95% CI [6.82, 1.94]) and serious depression (mean difference=3.68, 95% CI [6.09, 1.28]) in the past 30 days compared to those without an attempt. Finally, age, lifetime heroin use, diagnosis, housing status, sexual orientation, education, and sex were not statistically associated with lifetime suicide attempt (see Table 6).

Multivariable Logistic Regression Results Predicting Lifetime Suicide Attempts

In the final multivariable logistic regression model, we examined the association between ACEs and lifetime suicide attempt while controlling for the effects of other covariates. Latines who experienced serious depression had higher

Table 5 Bivariate association between lifetime suicide attempt and study variables ($N=299$)

Variables	Lifetime Suicide Attempt		
	No	Yes	
	%	%	χ^2
ACEs score			12.05 ($p<.001$)
0–3	83.9	16.1	
4–10	64.5	35.5	
Latine ethnicity			5.67 ($p=.017$)
Other Latine	77.9	22.1	
Puerto Ricans	64.8	35.2	
Sex			0.003 ($p=.847$)
Male	71.2	28.8	
Female	72.3	27.7	
Education			1.27 ($p=.529$)
Less than high school	69.4	30.6	
High school graduate or equivalent	76.2	23.8	
At least some college or vocational school	70.9	29.1	
Sexual orientation			2.53 ($p=.112$)
Heterosexual	72.3	27.7	
Gay, lesbian, or bisexual	45.5	54.5	
Employment status			5.95 ($p=.015$)
Unemployed	68.3	31.7	
Employed	85.7	14.3	
Housing status			0.012 ($p=.913$)
Unhoused	70.9	29.1	
Housed	72.2	27.8	
Diagnosis			5.65 ($p=.059$)
Substance use disorder	86.2	13.8	
Mental health disorder	77.3	22.7	
Co-occurring disorder	67.6	32.4	

Table 6 T-test comparing mean differences between those without and with a lifetime history of suicide attempts

Variables	p	ΔM	t	95% CI	Cohen's d
ACE score	<0.001	-1.33	-4.61	-1.90, -0.76	0.60
Age (years)	0.903	-0.18	-0.12	-3.16, 2.79	0.02
Lifetime cocaine use (years)	<0.001	-4.59	-3.28	-7.37, -1.81	0.48
Lifetime heroin use (years)	0.102	-1.95	-1.64	-4.28, 0.39	0.21
Anxiety or tension, days in past 30 days	<0.001	-4.38	-3.53	-6.82, -1.94	0.45
Serious depression, days in past 30 days	0.003	-3.68	-3.01	-6.09, -1.28	0.39

odds of reporting a lifetime suicide attempt than those who had not experienced serious depression ($OR=1.04$, $p=.027$, 95% CI [1.00, 1.07]). Additionally, those who experienced serious anxiety had higher odds of reporting a lifetime

Table 7 Multivariate logistic regression results predicting lifetime suicide attempts

Variables	OR	95% CI	<i>p</i>
ACEs score	1.21	1.07, 1.38	.003
Latine Ethnicity (ref: Other Latine)	2.04	1.13, 3.67	.018
Unemployed (ref: employed)	2.39	1.02, 5.63	.045
Serious depression	1.04	1.00, 1.07	.027
Serious anxiety	1.03	1.00, 1.07	.031
Interaction effects			
Puerto Rican × cocaine use (years)	1.04	1.01, 1.08	.015
Other Latine × cocaine use (years)	1.01	0.96, 1.08	.655
Constant	0.02	0.00, 0.00	<.001

suicide attempt than those who did not experience serious anxiety ($OR=1.03$, $p=.031$, 95% CI [1.00, 1.07]). Higher ACE scores were associated with higher odds of reporting a lifetime suicide attempt ($OR=1.21$, $p=.003$, 95% CI [1.07, 1.38]). Unemployed clients were associated with higher odds of reporting a lifetime suicide attempt ($OR=2.39$, $p=.045$, 95% CI [1.02, 5.63]). Additionally, Latines who identified as Puerto Rican were associated with higher odds of reporting a lifetime suicide attempt compared to Other Latine ($OR=2.04$, $p=.018$, 95% CI [1.13, 3.67]).

Finally, in the interaction model, we found that Latines who identified as Puerto Ricans and used cocaine during their lifetime were associated with higher odds of reporting a lifetime suicide attempt ($OR=1.04$, $p=.015$, 95% CI [1.01, 1.08]). However, we found no interaction between Other Latine and lifetime cocaine use in predicting lifetime suicide attempts (see Table 7).

Sensitivity Analysis

To test the robustness of our findings, we conducted a sensitivity analysis examining the association between ACE scores of four or more and lifetime suicide attempts. Latine individuals with an ACE score of 4 or more were 2.3 times more likely to report a lifetime suicide attempt compared to those with fewer than four ACEs. Our logistic regression model was statistically significant, $\chi^2(7) = 46.851$, $p < .001$. The model explained 21.1% (Nagelkerke R^2) of the variance in lifetime suicide attempts and correctly classified 76.3% of cases.

Discussion

Guided by intersectionality theory, this study investigated the associations of Latine ethnicity, ACE scores, and lifetime suicide attempts in a group of high-risk Latine adults entering behavioral health treatment. This study is unique and adds to the current literature by emphasizing the significant public health implications of ACEs and lifetime suicide

attempts in a high-risk Latine population. We found that about 4 in 5 Latine adults entering behavioral health treatment were unemployed, 1 in 2 had a co-occurring disorder diagnosis, and 1 in 3 had attempted suicide in their lifetime. Additionally, Puerto Rican adults showed higher rates of suicide attempts compared to other Latine ethnicities.

The proportion of Latine adults who experienced a lifetime suicide attempt is consistent with our previous study [7], which found that 1 in 4 Latine adults entering co-occurring mental health and substance use disorder treatment reported having attempted suicide in their lifetime. Our findings on the prevalence of suicide attempts must be interpreted in the broader societal context of the COVID-19 pandemic, which disproportionately affected many racial and ethnic minority groups, including Latine individuals, disrupting their psychosocial well-being [45, 46]. The COVID-19 pandemic and lockdowns exacerbated structural barriers, creating financial problems, housing instability, reduced social support and social isolation, and barriers to mental health treatment [47], which may have influenced suicide attempts [48, 49], particularly among high-risk individuals struggling with substance use. Therefore, clinicians working with high-risk individuals who have previously attempted suicide should conduct a thorough risk assessment, assessing for substance use, and collaboratively work with the client to create safety plans to reduce the risk of suicide attempts and assist them in effectively coping with suicidal ideation.

Our study found that higher ACE scores were associated with an increased likelihood of reporting lifetime suicide attempts, which was consistent with previous studies [33, 36, 50, 51]. We found that about 1 in 2 Latine adults experienced four or more ACEs. This proportion is consistent with some previous studies on Latine individuals [26, 52], though slightly higher than other studies. Felitti [13] posited that adults who experience four or more ACEs are at greater risk of experiencing negative physical and mental health outcomes. Our results confirm that specific stressors—in this case, ACEs exposure—can significantly affect Latine individuals by disrupting their psychological, social, physical, and behavioral development, increasing their risk of mental health challenges [14, 53] and suicide attempts [33, 51]. The intersection of Latine ethnicity and cultural stigma surrounding mental health can lead to insufficient treatment of ACEs. Moreover, those who grew up in a household with dysfunction and encountered parental separation and emotional abuse often lack appropriate problem-solving skills, hindering their capability to solve their problems, thereby elevating their risk of attempting suicide [54]. Understanding the association between ACE scores and lifetime suicide attempts in a high-risk group of Latines adults is critical for early suicide prevention efforts. Early suicide prevention

efforts should be implemented in schools, given they are the ideal setting for early identification and intervention for Latine children and youth with co-occurring mental health and substance use disorders. Many Latine children and youth often navigate social determinants of health stressors such as poverty, lack of access to mental health care, discrimination, and immigration-related issues [55], all of which increase their risk of suicide attempts. Therefore, providers can work with schools to enhance their capabilities by equipping school officials (teachers, staff members) with culturally appropriate training to recognize the warning signs and quickly intervene with referrals before the crisis worsens.

In this study, unemployment emerged as a significant predictor of lifetime suicide attempts. These findings were consistent with our previous study [7]; we found that 4 in 5 Latine adults entering behavioral health treatment were unemployed, and this subgroup was more likely to have attempted suicide. Nagelhout et al. [56] found that psychological distress related to unemployment was associated with higher rates of illegal drug use. Employment and economic stability can provide great psychological and social benefits that enhance an individual's mental well-being. However, unemployment can be a stressful life event that can lead to feelings of inadequacy and burdensomeness; these emotions can lead to a range of mental health problems such as depression, anxiety, substance use, and suicide attempts [57–60]. Moreover, Latine individuals are disproportionately affected by systemic inequalities such as lack of employment opportunities, lower educational attainment, and higher exposure to community violence [61, 62], all of which contribute to psychological distress, making unemployment a significant driver of suicide attempts. Based on our findings, we recommend that integrated behavioral health organizations respond to the social drivers of health by collaborating with employment support services to create upward mobility and economic stability for their Latine clients, which can alleviate mental health consequences and reduce the risk of suicide.

This study also found that anxiety and depression were associated with lifetime suicide attempts among Latine individuals. Consistent with previous research [63–65], anxiety and depression are the most prevalent mental health issues among Latine adults. One possible explanation for this association is the effects of acculturative stress, discrimination, language barriers, limited access to mental health services and substance use treatment, and restrictive immigration policies, especially for those who lack permanent residency and citizenship status [66–68]. For many Latine adults, acculturative stressors have exacerbated their anxiety and

depression and subsequently increased their risk of attempting suicide [69]. Therefore, clinicians treating this high-risk population with co-occurring mental health and substance use disorders should consider their intersectional identities (Puerto Rican vs. continental American, immigration status, socioeconomic position) and use a trauma-informed approach that focuses on reducing depression and anxiety symptoms and building psychological resilience. Additionally, clinicians must continue to advocate accessible and affordable treatment for co-occurring mental health and substance use disorders for all, particularly those at risk of suicide.

Finally, we uncovered an interaction effect indicating that an individual's identity, specifically their Puerto Rican ethnicity, influenced the relationship between cocaine use and lifetime suicide attempts. This finding is novel because it indicates that the combination of being Puerto Rican and using cocaine significantly increases the probability of attempting suicide. Furthermore, Puerto Rican adults living on the mainland who use cocaine are at greater risk of attempting suicide compared to adults of other Latine ethnicities who use cocaine as their main drug. These findings are consistent with research emphasizing how the sociopolitical history of Puerto Rico has significantly influenced social drivers of health affecting Puerto Ricans. Puerto Ricans navigate the intersections of their dual identities as U.S. citizens and residents of a U.S. territory where colonialism has significantly contributed to poor mental and physical health outcomes [70–73]. As a result of colonialism, Puerto Ricans are disenfranchised by poverty, racism, discrimination, access to health care, and insufficient mental health infrastructure [74–76]. To address this, we advocate a decolonized approach that involves systemic reform, improved access to quality mental health care, and culturally responsive mental health services that empower Puerto Ricans.

The results from this study emphasize the need to move away from a one-dimensional assessment framework. A new and innovative culturally responsive intervention effort needs to be developed to prevent suicide attempts among Puerto Ricans with behavioral health challenges. Practitioners working with Latine individuals must also consider the historical trauma that continues to influence the disparities they face. Therefore, they should adopt an integrated treatment approach that employs cultural strengths, such as *familismo*, while understanding and exploring the complexities of families associated with ACEs. Further, there is a clear need to improve policies and expand programs such as employment and educational support services that reduce structural inequalities and address these social drivers of health.

Limitations

Several limitations of this study are worth noting. First, this was a convenience clinical sample of high-risk Latine adults entering behavioral health treatment; therefore, this sample cannot be generalized to the entire Latine population but only to those in clinical outpatient settings. Second, this study was cross-sectional, and the data prevented us from making any causal assertions regarding ACE scores and lifetime suicide attempts. Third, our study used the original Wave 2 ACE scale, which is limited because it does not capture culturally relevant adversities (acculturation stress) and other protective factors essential in understanding the impact of ACE scores in the Latine community. The ACE data are retrospective, which means they relied on individuals' memories and are subject to recall bias. Additionally, although the original ACE scale (Wave 2) demonstrated excellent internal consistency ($\alpha = 0.88$), the Cronbach's alpha in our study was low. This could be a result of contextual differences in these sample characteristics [77]. Fifth, only binary data were collected for gender; future studies should explore the associations of transgender Latine individuals, ACE exposure, and suicide attempts.

Conclusion

In summation, understanding the intersections of Latine ethnicity, ACE scores, and lifetime suicide attempts is crucial in providing culturally responsive behavioral health and socially supportive interventions. More specifically, for individuals identifying as Puerto Ricans living on the mainland with behavioral health challenges, researchers and practitioners need to understand the impact of colonialism on social drivers of health and suicide attempts. Future studies can explore protective factors and how they buffer suicidality in clinical samples.

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Data Availability The authors do not have permission to share data.

Declarations

Competing interests The authors declare no competing interests.

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