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ORIGINAL PAPER

The Prevalence of Mental Illness and Substance Abuse Among Rural Latino Adults with Multiple Adverse Childhood Experiences in California

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Abstract
Adverse childhood experiences (ACEs) have been found to increase health and mental health risks in adulthood. Previous ACE studies tend to have small samples of Latinos; however, as Latinos are projected to be the largest minority group in the United States, it is important to examine how ACEs are associated with self-reported mental distress and alcohol and/or substance abuse among Latino populations. An ACEs survey was conducted in a predominantly Latino town; the sample included 195 individuals (18 or older), and the majority (92%) identified as Latino. Logistic regression showed that respondents with three or more ACEs, compared to those with no ACEs, were three times more likely to report more days of mental distress and eight times more likely to have alcohol and/or substance abuse problems. Further studies are needed to understand the association between ACEs and behavioral health using culturally and linguistically competent mental health screening tools.

Keywords Latinos · Behavioral health · ACEs · Rural · Mental health

Background

The U.S. Census Bureau's 2012 report estimated that Latinos will make up almost one-third of the U.S. population by 2060 [1]. According to the Pew Research Center, California has approximately 15 million Latinos, surpassing Whites as the largest group in California, and a significant portion of this Hispanic population (31%) is experiencing poverty [2]. Adverse childhood experiences (ACEs) are deeply distressing and disturbing childhood traumas experienced during the first 18 years of life. They include abuse, neglect, parent rejection, and household dysfunction, such as witnessing domestic violence, a parent's substance abuse and/or mental illness, parental incarceration, and separation/divorce. ACEs have been found to increase health risks in adulthood for alcohol problems, drug abuse, depression, smoking, and obesity, to name a few. The original ACE study by Felitti et al. was conducted with a predominantly White (74.8%), higher-income group, in which Latino respondents consisted of only 11.2% of the total sample [3]. Studies in the literature have included only small samples of the Hispanic/Latino population [4–8], but they have found that Hispanics/Latinos with ACEs had a higher probability, compared to other racial and ethnic groups, of cigarette smoking, binge drinking, marijuana use, and hard drug use, as well as an increased risk for starting to drink at a young age [6–8]. A 2017 study of a solely Hispanics/Latinos sample found that most participants experienced at least one ACE and were associated with depressive symptoms, unhealthy body mass index, smoking, alcohol use, cancer, coronary heart disease, and chronic obstructive pulmonary disease, but not asthma, diabetes, or stroke [9]. However, the sample was largely from urban settings (Bronx, Chicago, Miami, and San Diego), not rural areas.

This paper aimed to fill the gap in the literature to better understand the prevelance of adverse childhood experiences among Latinos in rural areas. As Latinos are the largest ethnic group in California and the fastsest growing population in rural America [10], it is imperative to further understand the role of ACEs in adulthood mental distress

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and alcohol problems among this group, particularly as ACEs have been found to increase depressive disorders in both recent and lifetime depressive disorders years after their occurrence [11]. Furthermore, we were especially interested in rural Latinos as there are increasingly Latino-majority towns in California and elsewhere. Thus, this study sought to expand the knowledge of the prevalence of ACEs through surveying Avenal, a small, rural, Latino-majority town, and to identify a similar association that parallels the original ACE study by Felitti et al. This study aimed to address the following research questions: (1) What is the overall prevalence of mental distress and substance abuse in Avenal? (2) What is the overall prevalence of ACEs in Avenal? and (3) What is the relationship between ACEs and mental distress/substance abuse? The study received approval from the Human Subjects Review Committee at the California State University, Fresno, within the Department of Social Work Education.

Methods

Data Collection

The Avenal Behavioral Health Survey (ABHS) consisted of demographic questions, self-reporting of mental health and alcohol and drug use (CAGE-AID), and ACEs [11]. The survey was administered between December 10, 2016, and January 9, 2017, in Avenal, California. Avenal is a small rural town located in Kings County, California, which is approximately 70 miles southwest of Fresno. Avenal has a population of 15,000 residents (including inmates from the local prison), the majority of whom are Latino (70%). Avenal is composed mostly of males (70%), according to 2010 U.S. Census Bureau statistics, and approximately 40% of the population live in poverty [12]. Initially, it was very difficult to administer the ABHS survey as the residents had issues related to trust, especially given the new immigration policy under President Trump. This trust issue was addressed by hiring two research assistants from the target community and by expanding the prinicpal investigator's availability to answer questions from participants. These steps resulted in the participants' increased feeling of a connection with the researchers, and the participants then spread the word about the study to other community residents, resulting in the expression of *community confianza* ("community trust").

Sample

The first 80 participants were recruited through the research team's direct approach of people who were entering State Market, which is the largest grocery store in the area and located on the main street in Avenal (Skyline Blvd.), during two weekends in December 2016. Researchers recruited the remaining 115 participants at community events (e.g., food bank) and social events (e.g., visiting parks). The survey was administered in English or Spanish based on respondents' preference. The sample consisted of 195 individuals aged 18 or above. This study is unique because an overwhelming majority (92%) of the survey respondents identified as Hispanic/Latino. The majority of the survey included questions on self-reported mental distress, substance use, and ACEs [3]. In addition, the survey collected participants' demographic information, including sex, primary language spoken at home, country of birth, civil status, level of education, household income, and size of household.

Measures

Our criteria variables included the following two measures: (1) self-reported mental health and (2) alcohol problem and drug use. Self-reported mental health was coded based on the survey question "Now thinking about your mental health, which includes stress, depression, and problems with emotions, for how many days during the past 30 days was your mental health not good?" Those who reported "eight days or more" were classified as experiencing mental distress; those who reported "fewer than eight days" were coded as not experiencing mental distress. Alcohol problems/drug use, measured by CAGE-AID [13], included four questions designed to identify problems with alcohol or drug use. Individuals having a CAGE-AID score of two or higher were considered to be at a clinically significant risk of problems related to alcohol problems or substance abuse [13]. The predictor variable was exposure to childhood trauma, also known as adverse childhood experiences (ACEs). The ACEs survey question included whether study participants, before reaching the age of 18, experiencedone or more of ten ACEs, including abuse (sexual, physical, and verbal), neglect (physical and emotional), and household dysfunction (e.g., caregivers' problems of substance abuse and/or mental illness, parental incarceration, separation/divorce, and witnessing domestic violence).

Analysis

To examine how ACEs are associated with mental distress and substance abuse, we conducted logistic regressions and estimated the odds of having frequent mental distress and alcohol problems. Control variables included the respondent's sex, age (18–25 years, 26–35 years, 36–45 years, 46–55 years, and over 55 years), primary language spoken at home (English or Spanish), ethnicity (White or Hispanic/Latino), level of education (less or more than high school), income (< $20,000 per annum was classified as low income), and size of household (> 6 members in a household was

classified as large). In addition, we included marital status, where respondents were classified as single if they were divorced, separated, never married, or widowed, and married/cohabitated if they were married or lived with a partner. These variables are known to be associated with mental distress and substance abuse, which facilitated the process of constructing and finalizing the model [14–19]. We classified respondents into three categories: no ACEs, one or two ACEs, and three or more ACEs. In previous studies, ACEs are often classified as no ACEs, one ACE, two ACEs, and three ACEs or more; however, due to the small sample size, we combined one ACE and two ACEs into one category.

Results

Out of the 195 participants, 58% answered the survey in Spanish (n = 113) and 42% (n = 82) in English. Overall, the majority of the sample was living in low-income households (63%, n = 71), with household income < $20,000. Slightly over half of the sample was female (56%, n = 63) and aged from 18 to over 55 years old. The overwhelming majority was Latino (94%, n = 106), the majority spoke Spanish (69%, n = 77) as a preferred language, and about 56% completed at least high school (n = 63). More than one-third lived in a large household (six or more household members). We also compared participants' socio-demographic characteristics by their level of exposure to ACEs.

Prevalence of ACEs

Our first research question was "What is the prevalence of ACEs among rural Latinos?" Overall, 28% of Latino respondents living in rural areas had one or more ACEs and 37% had three or more, while 35% reported no ACEs. Table 1 summarizes the participants' demographic characteristicis by the level of ACEs.

The majority of those with three or more ACEs were female (63%, n = 47), Spanish-speaking (71%, n = 80), single (65%, n = 73), and low-income, with household income being under $20,000 (67%, n = 75). Among those without exposure to ACEs, about 60% (n = 41) had at least a high school education, 42% were married or living with a partner (n = 28), and 52% were male (n = 36). Of those having experienced no ACEs, 42% earned at least $20,000 (n = 29).

Prevalence and Relationship of Mental Distress and Substance Abuse

Table 2 shows the results from the multivariate logistic regression and examines the second research question, regarding the relationship between ACEs and mental distress and substance abuse.

Table 1 Descriptive analysis of the study sample by ACEs scores

	All (N = 195) (%)	No ACEs (n = 69) (%)	1–2 ACEs (n = 56) (%)	3 or more ACEs (n = 75) (%)
Demographic characteristics				
Female	56	48	54	63
18–25 years	21	25	17	24
26–35 years	22	28	16	20
36–45 years	16	17	16	16
46–55 years	19	17	23	15
Over 55 years	22	13	27	25
Spanish	69	65	66	71
Hispanic/Latino	94	95	89	91
Less than high school	43	40	47	42
Large household (> 6)	35	36	31	36
Single	39	56	59	65
Low income (< $20,000)	63	58	61	67
No ACEs	35	–	–	–
1 or 2 ACEs	28	–	–	–
3 or more ACEs	37	–	–	–
K10 ≥ 20 and ≤ 29: mild to moderate mental disorder	30	32	30	27
K10 ≥ 30: severe mental disorder	15	29	15	20
Frequent mental distress	10	4	9	15
CAGE(≥ 2)	24	13	18	36

Table 2 The odds of frequent mental distress and alcohol problems (N = 195)

	Experiencing mental distress			Having alcohol problems		
	Odds ratio	95% CI		Odds ratio	95% CI	
Reference: 0 ACE						
1 or 2 ACEs	1.506	0.404	5.613	1.971	0.666	5.839
3 or more ACEs	**2.987***	0.968	9.221	**8.129***	2.925	22.59
Reference: males						
Females	2.116	0.814	5.499	**0.012***	0.047	0.283
Reference: 18–25 years						
26–35 years	0.386	0.091	1.647	1.249	0.381	4.096
36–45 years	0.664	0.155	2.842	0.701	0.197	2.495
46–55 years	0.367	0.079	1.709	0.628	0.173	2.283
Over 55 years	1.444	0.395	5.28	0.492	0.137	1.771
Reference: English						
Spanish	2.005	0.557	7.219	0.462	0.16	1.336
Reference: White						
Hispanic/Latino	0.971	0.141	6.665	0.724	0.142	3.706
Reference: higher than high school education						
Less than high school	0.524	0.182	1.51	2.147	0.793	5.816
Reference: small household (< 6)						
Large household (6 or more)	0.889	0.345	2.293	1.706	0.725	4.014
Reference: married/live with partner						
Single	1.458	0.577	3.685	0.823	0.361	1.876
Reference: income with more than > $20,000						
Income < $20,000	1.114	0.428	2.899	1.245	0.537	2.885

Compared to those with no ACEs, respondents with three or more ACEs were about three times more likely to report more days of mental distress [OR 2.987; 95% CI 0.968–9.221], while controlling for socioeconomic characteristics. On the other hand, individuals with one or two ACEs were not significantly more likely to report mental distress than those without ACEs. With respect to substance use, those with three or more ACEs were significantly more likely to have alcohol problems or use illicit substances, and those with three or more ACEs were eight times more likely to have alcohol problems than those without ACEs [OR 8.129; 95% CI 2.925–22.592], while controlling for sociodemographic characteristics. Again, there was no significant difference between those with one or two ACEs and those without ACEs.

Discussion

In this study, we found that close to 40% of participants living in predominantly Latino rural areas experienced three or more ACEs, which was much higher than the study done by the CDC [3]. Allem et al.'s study found that the number of ACEs was significantly associated with binge drinking among Latinos (24% more likely) [6]. Fang and McNeil also found that the risk of heavy drinking was greater among both men and women who were exposed to four or more childhood adversities; specifically, for the Latino sample, the risk is 20% greater than those without ACEs [20]. In addition, Merrick et al. found a strong relationship between the expanded ACE score and the likelihood of moderate to heavy drinking in adulthood [21]. Using the Behavioral Risk Factor Surveillance System (BRFSS) data, Lee and Chen found that Latinos who experienced ACEs were 15.57% more likely to binge drink [7]. However, only 4% of the study sample were Latinos, as the sample was not drawn from states with larger Latino populations (e.g., California, New York, or Texas). Previous studies often did not specify whether the participants lived in rural or urban areas, but the present study focused on residents in a rural Latino-majority town; further, this study found that rural Latinos who experienced three or more ACEs were also more likely to have alcohol problems—a finding that concurs with aforementioned studies regarding non-rural Latino population.

On the other hand, using the self-reporting mental health status, our study results indicate that those with three or more ACEs were three times more likely to report days of experiencing mental distress and were eight times more likely to have alcohol/drug problems. These findings also mirror previous studies that found significant associations between ACEs and experiencing mental distress and using alcohol/drugs [3, 6–8] among Latinos in adulthood. Latinos with

ACEs may be self-medicating through alcohol or substance to deal with childhood trauma associated with ACEs. Thus, childhood trauma is a public health concerns, as it leads to alcohol problems and/or experiencing frequent mental distress among Latinos, who are less likely to utilize behavioral health services [22, 23]. Finally, our study contributes to a better understanding of the high prevalence of ACEs and their association with mental distress and substance abuse problems among Latinos living in small rural towns, a population that is often understudied. Nearly 3.2 million Latinos live in rural areas of the United States, comprising 6.3% of the nation's population living in non-metro areas [24]. These rural Latinos often live in medically underserved areas and have limited access to appropriate behavioral health services [23]. Since ACEs also lead to arrest, felony charges, and difficulties with sustaining employment [25], a more comprehensive examination of ACEs among this rapidly increasing population is critical.

Implications

Social work practitioners working with Latinos who prefer to speak Spanish, are low-income, and are single should carefully assess for issues surrounding mental distress and alcohol and substance abuse. Culturally and linguistically competent ACEs studies are needed to understand a larger spectrum of expressions that capture emotional distress among Latinos and other minority populations, as the way they express their mental health varies across culture [26]. Implications for policy include the need to further understand the role of ACEs in adulthood mental distress and substance abuse among Latinos living in rural communities, the need for more awareness of the impact of ACEs on behavioral health in order to develop and implement prevention and intervention programs that are culturally and linguistically appropriate, the need for prevention programs aimed at parents/children, and the need for intervention programs tailored for adults who have been victims of ACEs.

Limitations

The study's limitations include self-reported measures of ACEs and behavioral health outcomes [6]. Our study sample was relatively small (about 200 residents), and our findings are potentially unique to the Avenal community and thus not generalizable to other rural communities in the United States. In addition, convenience sampling was used, and the sample was not necessarily representative of the population in Avenal. Furthermore, the self-reporting procedure might not have effectively detected mental distress among Latinos in rural communities because of the language and conceptual differences between European and Latino cultures. For example, Barrera et al. found that Latinos in rural south Texas (Rio Grande Valley) used words such as *aguitado* (sad) and *frikiado* (freaked out) to describe their mental distress, highlighting the difference between self-reporting language and rural Latino community language, which indicates a strong probability that self-reporting may not be the most effective in capturing mental distress in rural Latino populations [27]. Future research should explore the use of culturally appropriate measures to better capture the association between ACEs and behavioral health problems among this population.

Compliance with Ethical Standards

Conflict of interest There is no conflict of interest.

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