

# The Impact of Depression and Acculturation on Injection Drug Use among Male Latino Injection Drug Users

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## Abstract

**Background:** Among U.S. injection drug users (IDUs), Latinos account for 21% of new HIV/AIDS cases. Acculturation, coupled with depressive symptoms, has been found to impact risky behaviors increasing susceptibility to diseases such as HIV and Hepatitis B/C. This study explores the impact of depressive symptoms and acculturation on injection drug use among Latino IDUs in South Florida.

**Methods:** The parent study examined the prevalence of HIV, Hepatitis B & C virus infections, and associated risk factors among Hispanic IDUs in Miami-Dade County, Florida over five years (2005–2010). Participants of this study ( $n=210$ ) were compared on frequency of IDU, acculturation to U.S. culture, and years living in the U.S. across four Beck Depression Inventory classifications (minimal, mild, moderate, and severe depression).

**Results:** On average, participants were 35.86 years old, living in South Florida for 8.73 years. Over half had completed at least high school, but 82.4% of subjects were unemployed. Over 98% had used heroin intravenously at some point in their lives, and 88.3% had used within the past day. More than 80% expressed symptoms of moderate or severe depression. Those expressing mild depression injected fewer times in the past three months than those expressing moderate or severe depression. Participants who expressed severe depression were also newer to the U.S. and less acculturated to American culture.

**Conclusion:** For some Latinos, U.S. acculturation may be a protective factor against depression. Early immigration may be a critical time for intervention to prevent depression and risky IV drug use among Latinos.

**Keywords:** Latino injection drug users; Sexual risk behaviors; Depression; HIV/AIDS risk; Hepatitis C virus

## Introduction

Mental illnesses plague the global community, and such illnesses tend to be underdiagnosed. Depression, one of the most common mental illnesses in the U.S., can impact all facets of one's mood, daily functioning, and behaviors. Research has shown that, compared with the general population, people addicted to drugs are twice as likely to suffer from mood and anxiety disorders; the reverse is also true. In 2014, approximately 7.9 million adults had co-occurring psychiatric

and substance use disorders [1]. Additionally, individuals with non-addictive psychiatric disorders are more likely to engage in drug use than the general population [2,3].

Substance use disorders and depression together can have a synergistic effect upon multiple risk behaviors and health outcomes [4]. It has been reported that injection drug users (IDUs) with depressive symptoms were more likely to engage in risky behaviors, such as sharing syringes and injection equipment [5,6]. Another study conducted by Li et al. [7] on

IDUs with depressive symptoms in China reported that the level of severity of the participants' depression was positively associated with an increased dependence on drugs.

Latinos are the largest ethnic minority in the United States, comprising 17% of the overall U.S. population, 23% of the Florida population, and 66% of the Miami Dade population [8]. Latinos represent a disproportionate percent of HIV infection in the U.S. and may be at heightened risk for substance use disorders and associated health risks. According to the Centers for Disease Control and Prevention (CDC) [9], Latino men are more likely to be exposed to HIV through intravenous drug use than are white men. The heightened risk for HIV infection among Latinos has been attributed to issues of poverty, low educational attainment, limited access to healthcare, and high levels of IDU [9]. HIV positive Latino men report injection drug use much more frequently than white men. Among Latino men with AIDS, 35% report injecting drugs, as opposed to white men with AIDS, among whom 9% report injection drug use.

Acculturation may also contribute to variations in drug use and mental health comorbidities. Acculturation has been defined as "how ethnic minority individuals adapt to the dominant culture and the associated changes in their beliefs, values, and behaviors that result from contact with the new culture" [10]. Acculturation is usually thought to be associated with distancing from one's native roots. Recent studies have indicated that Latinos that are highly acculturated by internalizing US values tend to be at an increased risk for drug use [11-13]. The results in a study by Blanco et al. [11] indicated that Hispanics that have lived in the US longer, as well as acculturated to the mainstream culture, had a significantly higher chance of having a drug use disorder. Similar findings were described by Rote and Brown [12] and Sanchez [13] who showed that participants with higher levels of acculturation were at a higher risk of consuming alcohol or drugs than their less acculturated counterparts.

This study examines depressive symptoms, acculturation, and frequency of injection drug use among male, Latino IDUs in South Florida. We hypothesized that recently migrated less acculturated Hispanics are prone to depressive symptoms, which can lead to increased drug use. Outcomes from this study can aid in a deeper understanding of the risks for depression and comorbid substance use disorders among Latinos, ultimately contributing to the development of effective prevention interventions.

## Materials and Methods

### Study sample

The data used for this study was drawn from a comprehensive study of Hispanic IDUs in South Florida. The parent study was focused on examining the prevalence of HIV, Hepatitis B & C virus infections (HBV, HCV), and associated risk factors among Hispanic IDUs for lasting 5 years, after two years of non-competing continuations (2005–2010). The sample was

composed of 210 Hispanic male IDUs who were recruited from non-institutional settings (streets, vacant lots, parks, copping and shooting spots, etc.) across Miami-Dade County, Florida, using a targeted snowball sampling strategy. Inclusion criteria for the parent study included being 18 years of age or older, of Hispanic origin, and a resident in Miami-Dade County, including homeless persons. In addition, participants had to have regularly injected opiates and/or cocaine and/or amphetamines for at least the past 3 months, used at least weekly for the past 30 days, and been able to give informed consent. Participants that did not want to participate were offered services or referrals they may have needed and provided with harm reduction items (e.g., condoms, bleach and HIV and hepatitis B and C prevention information) as appropriate for their situation. A twenty-five-dollar incentive was used to compensate participants for their time.

### Measures

**HIV/AIDS and Hepatitis B & C risk behaviors questionnaire:** The study questionnaire was administered through Computer Assisted Personal Interview (CAPI) technology. The questionnaire was designed to gather demographic information, alcohol and drug use history (ever), alcohol and drug use history (previous three months), injection practices, sexual behaviors and lifestyle, health and medical history, institutional history, social networks, acculturation, and readiness for treatment.

**Beck Depression Inventory (BDI-II):** The BDI-II was used to determine the presence and severity of clinical depression. The BDI-II is a widely used 21-item self-report inventory measuring the severity of depression in adolescents and adults. Numerous studies provide evidence for its reliability and validity across different populations and cultural groups [14,15]. In this study BDI-II depression scale was classified into four groups – minimal depression (raw score of 0-13), mild depression (raw score of 14-19), moderate depression (raw score of 20-28), and severe depression (raw score of 29-63). The Cronbach's alpha was 0.91 for the current study sample.

**Acculturation:** Acculturation was measured with the 20-item modified Bicultural Acculturation Scale (CRM-BS). In this scale, acculturation is formulated with a bicultural model assessing in parallel the degree of identification with both the original culture and the host culture. The modified CRM-BS is composed of two subscales: original Latino culture and mainstream US culture. Below are a few questions from CRM-BS:

- How important is it to you to celebrate holidays in the American way?
- How much are American values a part of your life?
- How comfortable would you be in a group of Americans who don't speak Spanish?

Similar questions were asked focusing on the Latino culture.

Strong test–retest reliability correlation coefficients (original culture, 0.78; mainstream-US, 0.82) and high internal consistency (Cronbach’s alpha; original culture, 0.88; mainstream-US, 0.80) have been documented. Following the scoring instructions provided by the original developers, US acculturation scores and Latino acculturation scores ranged from 0 to 60, with higher scores reflecting higher levels of acculturation [16,17].

### Statistical analysis

IBM SPSS Statistics for Windows, version 23.0 (Armonk, NY: IBM Corp.) was used for the analysis. Descriptive statistics including frequencies were used to describe the demographic characteristics of the participants. Descriptive statistics were used to analyze drug and alcohol use, acculturation levels and depression among the participants. ANOVAs and chi square analyses were used to compare participants across the four BDI depression classifications: minimal depression, mild depression, moderate depression, and severe depression. Statistical significance was set at  $P < 0.05$ .

## Results

### Participant characteristics

Participants were 210 male Latino injection drug users. The average age of the sample was 35.86 ( $SD=9.27$ ; range 20–61) years. About ten percent (9.5%) of participants were HIV positive, 74.8% of participants had hepatitis C, and 56.2% of participants had hepatitis B. Participants had lived in South Florida for an average of 8.73 years ( $SD=9.54$ ). About 82.9% of subjects reported being born in the US, with 3.8% born in Puerto Rico, 7.6% born in Cuba, and 5.7% born in another country. Approximately, 98.6% of subjects identified themselves as Hispanic or Latino. Almost 10.5% of subjects had completed 8<sup>th</sup> grade or less, 28.2% had attended some high school, 39.2% had completed high school, 20.1% had attended some college or technical school, and 2% had completed college. Roughly 82.4% of subjects were unemployed. Participants that were single/never married accounted for 56.2% of our sample, 16.2% of subjects were married, 26.2% were divorced, and 1.4% was widowed. About 18.1% of subjects reported living with a partner, and 44.8% of subjects reported living on the streets or in an abandoned building. The average number of children was 1.74 ( $SD=2.10$ , range 0–13). Table 1 presents the demographic information described above.

### Drug and alcohol use

About 80% of participants reported using alcohol in the past three months with an average number of drinks per day of 2.41 ( $SD=1.49$ , range 1–5). About 63% of subjects had used marijuana or hashish in the past three months, 52.8% reported using crack or cocaine, 51% of subjects reported using tranquilizers or barbiturates, 48.1% reported using heroin by itself, 47.1% reported using cocaine by itself, 21.4% reported using heroin and cocaine together, 19.1% reported using methadone that did

**Table 1:** Characteristics of the Participants

Characteristics	
Age, years, Mean (SD)	35.86 (9.27)
Education, years, %	
8 <sup>th</sup> grade or less	10.5%
Some high school	28.2%
Completed high school	39.2%
Some college or technical school	20.1%
Completed college	2%
Marital status, %	
Single/never married	56.2%
Married	16.2%
Divorced	26.2%
Widowed	1.4%
Length of stay in Florida, years, Mean (SD)	8.73 (9.54)
Country of birth, %	
USA	82.9%
Puerto Rico	3.8%
Cuba	7.6%
Other	5.7%
HIV positive, %	9.5%
Hepatitis B positive, %	56.2%
Hepatitis C positive, %	74.8%

not come from a program, 10.5% reported using club drugs, 10.5% reported using methamphetamines, 4.3% reported using PCP, 4.8% reported using hallucinogens, and 4.3% of subjects reported using inhalants in the past three months.

### Heroin use

Ninety-nine percent of participants reported using heroin by itself during their lifetime, with 98.8% reporting injection use of heroin. Regarding heroin and cocaine used together, 88.8% of participants reported use in their lifetime, and all use was reported to be injection use. Only 5.0% of subjects reported injection use of heroin and amphetamines together.

With regard to frequency of injection drug use, 88.3% of participants reported injecting within the 24-hour period prior to participation in this study, with 10.8% injecting between one day and one week prior and 0.9% injecting between one week and one month prior. Within the past three months, 74.2% of participants reported injecting heroin by itself one or more times per day, with 25.0% of participants injecting five or more times per day. With regard to injecting heroin and cocaine together, 46.7% reported injecting one or more times per day, with 21.7% injecting five or more times per day. Only 2.9% of subjects reported injecting heroin and amphetamines together within the past three months. On an average, participants reported injecting 5.37 ( $SD=3.38$ ) times per day, with a range of 1 to 20.

### Acculturation

U.S. acculturation scores and Latino acculturation scores ranged from 11.10 to 36.40, falling in the middle of the possible range of scores. Higher scores reflect higher levels of acculturation. The average score for involvement in the

American culture was 27.00 ( $SD=5.45$ ), and the average score for involvement in Latino culture was 31.70 ( $SD=4.71$ ). There was a larger proportion of participants that scored higher on the Puerto Rican acculturation scale ( $n=159$ ) than the American acculturation scale ( $n=39$ ), suggesting that these particular participants may be more acculturated to the Puerto Rican culture. There were approximately 11 subjects who scored the same on both acculturation scales.

### Depression

Scores on the BDI II ranged from 0 to 63 with an average score of 26.59 ( $SD=10.32$ ). Using BDI II classifications, 4.3% of participants were minimally depressed, 16.2% of participants were mildly depressed, 40.5% of participants were moderately depressed, and 39% of participants were severely depressed.

Those in the mild depression group had injected fewer times in a day compared to those in the severe depression group ( $F(3,209)=4.51, p=.004$ ). Those in the mild depression group had injected fewer times in the past three months than those in the severe depression group and fewer times than those in the moderately depressed group ( $F(3,209)=6.66, p<.001$ ). Those in the mild depression group had lived in South Florida longer than those in both the moderate and severe depression groups ( $F(3,209)=3.35, p=.020$ ). Those in the mild depression group had higher acculturation scores than those in the severe group, and those in the moderate depression group had higher acculturation scores than those in the severe depression group ( $F(3,209)=3.98, p=.009$ ). Those in the mild depression group had lower scores than those in both the moderate and severe depression groups regarding involvement in Latino culture ( $F(3,208)=5.09, p=.002$ ). These results indicate that those participants who were more severely depressed were the least acculturated to the American culture (Table 2).

There were no differences between the four groups on demographics including age, education, ethnicity, marital status, and HIV status. There were also no differences with regard to age of first drug use, money spent on drugs per week, number of people injected with, number of people having shared injection equipment with, or number of alcoholic drinks.

### Discussion

This study focused on the interplay of depression, acculturation, and injection drug use among Latino drug users in South Florida. The results of this study shed light on how to address some of the health risk factors found in this overlooked community. A substantial proportion (nearly 80%) of participants in this study was moderately or severely depressed. Participants who were categorized with higher levels of depression were found to engage in riskier drug use behaviors; they injected drugs more frequently than their minimal to mild depression group counterparts. These findings have been reported in previous studies [18-20]. One longitudinal study found that depression may precede injection frequency, suggesting that treatment of the underlying depression may aid in decreasing risky drug use [20]. Nearly all participants in this study reported heroin use in their lifetimes; severity of depression is reported to be many times higher among heroin users than that seen in the general population [21-25]. The majority of subjects used heroin along with cocaine.

Those with a higher level of depressive symptoms had more recently relocated to the South Florida area and were less acculturated to the American mainstream culture. Conversely, those with lower levels of depression seemed to have assimilated into the mainstream culture to a higher degree and lived in Florida longer than those who were more depressed. This phenomenon runs counter to the “immigrant paradox.” Research has shown that Latinos living in the U.S. or exposed to the U.S. for longer periods of time most often display greater risk for developing mental illness and particularly depression [26-29]. Frequently, greater degrees of U.S. acculturation are also associated with a higher risk of drug use [30-33]. Latinos born in the U.S. or classified as more acculturated have been shown to demonstrate higher rates of drug use than their less acculturated counterparts [34-37].

Acculturation involves a variety of factors, such as the acquisition of new values, increased perceived discrimination, and difficulties in dealing with a multicultural environment [38]. However, it is possible that immigration into a community that is predominantly Hispanic, such as Miami-Dade County, mitigates much of the effects of acculturation stress. In other

**Table 2:** Associations between Depression, Frequency of Injection Drug Use (IDU) & Acculturation

Measure	Minimal Depression	Mild Depression	Moderate Depression	Severe Depression	F	p value	Group Comparisons
	Mean (SE)	Mean (SE)	Mean (SE)	Mean (SE)			
Number of times injected in a day	4.00 (1.80)	3.82 (2.68)	5.12 (3.29)	6.01 (3.22)	4.51	.004	Mild<Severe
Number of times injected	328.89 168.70)	328.53 (230.38)	407.35 (257.56)	527.07 (255.37)	6.66	<.001	Mild<Severe Mild<Moderate
Years lived in South Florida	8.67 (11.17)	13.38 (11.81)	7.73 (8.26)	7.85 (9.17)	3.35	.020	Mild>Severe Mild>Moderate
Involvement in American Culture	24.70 (7.57)	28.58 (4.60)	27.89 (4.84)	25.69 (5.83)	3.98	.009	Mild>Severe Moderate>Severe
Involvement in Latino Culture	31.96 (5.47)	28.92 (5.32)	32.43 (3.97)	32.06 (4.73)	5.09	.002	Mild<Moderate Mild<Severe

words, the new culture toward which one is acculturating may not be vastly different from the culture one has left and may also provide multiple opportunities for social support. Longitudinal research found that social support was negatively associated with acculturation-related stress [39]. The buffering model postulates that the perceived availability of psychological, social, and material support may act as a buffer, or protective agent [40]. A growing number of researchers have explored and found significant protective benefits of social support for Latinos [41-44].

## Limitations

This study is not without its limitations. Some limitations are inherent in the street-recruitment of drug users. This study is not necessarily representative of all IDUs, because a random sample could not be drawn; however, participants were recruited from different locations during different hours in order to increase the representativeness of the sample. Although the instrument used to measure acculturation is commonly used, it is important to note that the acculturation construct may be ambiguous. Research has demonstrated that language alone explains more than 85% of variance in some acculturation scales when the scales are used to predict health outcomes [45]. The population studied may not be representative of other Latino populations in the United States. Miami-Dade County is unique, with a predominantly Hispanic population. Additionally, while the most abundant nationality of Hispanics in the U.S. is Mexican, the primary nationality in Miami-Dade County is Cuban. Finally, it should be noted that information was self-reported and subject to recall bias.

## Conclusions

This study population reported substantial depressive symptoms, associated with increased risky IDU. Those Latinos more recent to the South Florida area scored higher in depressive symptomology, suggesting that early immigration would be the critical intervention point for preventing depression and increased IDU. In a highly Hispanic urban community like Miami, primary prevention and treatment interventions for reducing drug use should take advantage of the possible protective and buffering effect of Hispanic cultural features and values. At the level of health care providers, proper training to improve cultural competency could not only improve the mental health outcome, but also will aid in increasing access to care. Future research should seek to more deeply investigate any convergence of the progression of IDU and the natural evolution of immigration and acculturation among Latinos, paying particular attention to the validity of acculturation measures.

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