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Injecting Transition Risk and Depression among Mexican American Non-Injecting Heroin Users

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Abstract

INTRODUCTION—Existing research has documented high comorbid rates for injecting drug use (IDU) and social and health consequences including HIV infection, a condition that disproportionately affects U.S. Hispanic populations. Few studies have examined the specific associations between injecting transition risk among non-injecting heroin using (NIU) populations and mental health conditions. This study hypothesizes that injecting transition risk will be strongly associated with depression symptomatology controlling for age and gender among Mexican American NIUs.

METHODS—Street-recruited NIUs (n=300) were administered structured interviews. The Mexican American sample was predominantly male (66%), unemployed (75%) with more than half experiencing incarceration in their lifetimes (58%). Depression was measured using the CES-D scale. Univariate and multivariate logistic regression analysis were employed to determine the associations between the dependent variable of heroin injecting transition risk and the key independent variables of depression symptomatology and other independent variables.

RESULTS—Depression symptomatology was the strongest independent correlate of injecting transition risk. Those NIUs with high levels of depression symptomatology had more than three

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Contributors

Authors Avelardo Valdez and Alan Neaigus designed the study and were Principal Investigators. Charles Kaplan and Alan Neaigus undertook the statistical analysis and wrote the initial draft of the manuscript. Alice Cepeda was the project director and along with Avelardo Valdez contributed to the interpretation of data and finalized the manuscript. Yolanda Villarreal worked on early data analysis and the initial draft of the manuscript. Miguel Angel Cano contributed to the statistical analysis and writing of the data analysis section. All authors contributed to and have approved the final manuscript.

Conflict of Interest

There are no possible conflicts of interest involving products or consultancies that are related to this study.

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times the heroin injecting transition risk than those NIUs with low levels. Heroin use network influence was also found to be a strong correlate. Acculturation level was significantly associated with injecting transition risk.

CONCLUSION—The comorbid condition of depression symptomatology and heroin use places Mexican American NIUs at elevated risk of contracting blood-borne pathogens such as HIV. Development of prevention and treatment strategies that target Hispanic non-injecting heroin users in socially disadvantaged communities should consider depression symptoms and develop interventions that build new social networks.

Keywords

non-injecting heroin users; IDU; transition to injecting; social risk networks; depression; Mexican American

1. Introduction

There has been a recent growth in non-injecting use (NIU) of heroin among diverse United States (U.S.) drug populations and social settings (Broz and Ouellet 2010; Chitwood et al., 2003; Sosa-Zapata, 2007). Non-injecting heroin administration includes “sniffing,” smoking in cigarettes mixed with tobacco/cannabis and “shabanging” (spraying a mix of heroin and water into nasal cavities using a syringe). For some NIUs of heroin and other illegal drugs it may be a precursor to initiating injecting drugs among those who have never injected or through resuming injecting among those who are former injectors. Clearly, not all those who are NIUs transition to injecting but for those that do it has serious consequences for the risk of acquiring or transmitting HIV and other blood borne pathogens (hepatitis B (HBV) and hepatitis C (HCV) (Ameijden et al., 1994; Bravo et al., 2012; Neaigus et al., 2007). This article focuses on identifying the correlates of the risk of transitioning to injecting drug use among a sample of non-injecting Mexican American male and female heroin users.

Research has found transitioning to injecting drug use to be related to a wide range of risk factors (Darke et al., 1994; Des Jarlais et al., 2007; Hadland et al., 2010; Neaigus et al., 2011). Longitudinal studies in Amsterdam, Montreal and New York have been conducted of heroin NIU cohorts to identify specific risk factors that account for the transition from heroin NIU to IDU (Ameijden et al., 1994; Neaigus et al., 2006; Roy et al., 2003). Risk factors among these studies seem highly dependent upon the variations in methods, the characteristics of populations of NIUs and the social context from which the study samples are drawn. Among the New York and Montreal cohorts, white ethnicity, age (younger) and homelessness were consistent predictors of transitioning to IDU. Other individual susceptibility factors that have been documented as increasing the likelihood of transitioning to injecting include individual traumatic events, such as sexual abuse, violence victimization, suicide and acculturation (Fuller et al., 2002; Neaigus et al., 2001a; Vega et al., 1998). Differences in drug use behaviors and drug history characteristics were also identified in the cohort studies to be risk factors for transitioning such as a former injection history and frequency of current heroin use.

Depression symptomatology has been a special focus of drug research because of this individual susceptibility variable's association with drug and sex risk practices including needle sharing, frequent drug use and unprotected sex in heroin using populations (Havard et al., 2006; Johnson et al., 1999; Malbergier and Andrade, 2001). Among Mexican Americans, depression has been documented as a risk factor for a wide range of drug use behaviors (Felix-Ortiz et al., 1994; Hasin et al., 2005; Olvera et al., 2011). However, only the New York study has examined the predictive relationship between depression and transitioning to IDU among NIU populations and found it to be a statistically insignificant predictor (Neaigus et al., 2001a; 2006).

Independent of individual susceptibility, risk network characteristics have also been found to predict the transition to injecting (van Ameijden et al., 1994; Neaigus et al., 2006). The Amsterdam study identified the influence of having a current steady sexual relationship with an IDU as a risk factor for transitioning from NIU to IDU. The New York study applied network facilitation theory to document that social network influence through communication is a significant risk factor for transitioning (Neaigus et al., 1994). These study results indicate that distinct assortative mixing patterns are a key mechanism affecting transitioning to IDU. Assortative mixing theory claims that individuals in social networks tend to be connected to other individuals who are like them in some way (Newman and Girvan, 2003). These assortative mixing patterns form a distinct community structure of embedded interrelationships that influence the transition to injecting through interpersonal communication promoting injecting drug use and exposure to related risks (Bell et al., 2002; Kaufman et al., 2004).

This study argues that for Mexican American NIU populations, depression symptomatology may well have a strong influence on injecting transitioning risk although it has not been found to have a causal relationship in other studies. We contend that within the specific social context of San Antonio's West Side the effect of depression on injecting transition risk may be more salient than among other NIU populations. These neighborhoods are comprised predominantly of Mexican-origin persons characterized by concentrated poverty, unemployment, drug and alcohol use, crime and youth gangs (Bauder, 2002). Moreover, San Antonio over the decades has had high rates of heroin use and trafficking compared to other U.S. large cities and paradoxically a low HIV rate (ADAM, 2003; Desmond and Maddux, 1984; Valdez, 2005, 2007). Using the concept of syndemics, we contend that within this context the afflictions of heroin dependence and depression synergistically, contribute to the excess burden of infectious diseases in the study population (Singer and Clair, 2003).

The aim of this study is to determine how depression symptomatology, other individual susceptibility variables, drug and sex networks and socio-demographic variables are associated with heroin injecting transition risk among Mexican American NIUs in San Antonio. Heroin injecting transition risk is conceived as an immediate outcome of a complex process that may precede actual heroin injecting behavior. We hypothesized that high levels of depression symptomatology and the use of non-injecting heroin with an IDU would be significantly correlated with high injecting transition risk. The study also examines the role of culture in determining injecting transition risk since acculturation has been associated with and identified as a moderator of illicit drug use for Mexican American and

other Hispanic populations (Rodriguez et al., 2007; Vega et al., 1993; Castro and Alarcon, 2002). We hypothesized that low levels of acculturation would be statistically correlated with high injecting transition risk. It was also hypothesized that low acculturation would moderate a significant increase in the positive correlation between depression symptomatology with injecting transition risk. We recognize that acculturation may be influenced by a social context that magnifies the difference between gender roles tied to the structural features of the family. Therefore, the data analysis considers the potential confounding effects that gender and age may have on the relationship of the study correlates with heroin injecting transition risk.

2. Methods

2.1 Sampling and Recruitment

Approval for the study was obtained from the University of Houston IRB committee. Data for the analysis were from interviews with 300 Mexican American NIUs. The study used an adaptive sampling methodology combining street outreach and targeted sampling (Thompson and Collins, 2002; Watters and Biernacki, 1989; Yin et al., 1996). The prospective cohort study design consisted of a baseline interview with two follow up interviews at six- month intervals. Interviews were conducted in private using a structured questionnaire. Baseline interviews ranged from 2 to 3 hours in duration. Inclusion criteria for the cohort were: 16–35 years of age for males and 16–40 for females; self-reported and toxicology evidence of heroin use past 30 days; no recent injection (six months prior to enrollment); Mexican American ethnic background; and no participation in formal drug treatment 30 days prior to enrollment.

2.2 Measures

2.2.1 Dependent Variable—The key outcome (dependent) variable in this study is heroin injecting transition risk. Heroin injecting transition risk is a multidimensional measure collapsed into a single summative score that is composed of four indicators accounting for the total score: the Severity of Dependence Scale; former injector status; duration of heroin use and frequency of heroin use in the past month. This summative measure builds upon one that was originally developed in previous research and demonstrated that current NIUs with an injecting history and greater severity of dependence were more likely to potentially resume IDU (Valdez et al., 2007). In the current study, duration of heroin use was added to the summative measure and the psychometric properties were assessed. A confirmatory factor analysis (CFA) was conducted on the single variables associated with the scale items in order to assess the latent construct hypothetically measured by the summative scale (Carmines and Zeller, 1979). These data underwent 1000 iterations applying a bootstrap method using MPLUS 5.2 software. The confirmatory factor analysis yielded a one-dimensional measurement model with good model fit indices of RMSEA (0.00) and WRMR (0.92) indicating that the variables used to compose the scale items were all significantly contributing to the latent construct of injecting transition risk.

The total score of the Severity of Dependence Scale, a standardized scale of perceived heroin dependence for the 30 days prior to the interview composed of 5 items scored on a 4-

point scale (0–3): 1) you think heroin use was out of control; 2) without injecting makes you anxious/worried; 3) you worry about your heroin use; 4) you wish you could stop and 5) how difficult to stop or stop using (Gossop et al., 1992). The total score is obtained through the addition of the 5-item ratings. This total score was then dichotomized based on the cut-off score 6 used in the New York cohort study (Neaigus et al., 2006). The former injector indicator was dichotomized into the categories of never vs. former. Past month frequency of NIU was transformed into monthly/weekly use vs. daily use. Duration of heroin use was calculated by subtracting the age at which heroin was first used from the current age. The variable was then dichotomized based on the median value of the sample into 3 years vs. 4 years. Duration of heroin use has been found to be associated with transition to injecting in several studies and was the strongest predictor of injecting transition risk in a prior study of this sample (Valdez et al., 2008a).

The scale scores ranged from 0 to 4. Until further validation of the measure is conducted, a conservative approach was taken in that participants endorsing any 2 of the 4 indicators were considered to be at “high injecting transition risk.” The risk of transitioning to injection was conceived as an accumulation of risk factors that have been found to be associated with heroin IDU. Endorsing at least half of these indicators was deemed to have face validity for distinguishing high injecting risk from low injecting risk persons.

2.2.2 Independent Variables—The study’s independent variables were organized into three domains: individual susceptibility, social network influence, and socio-demographic and individual background. Depression symptomatology during the past 30 days was conceived as a key individual susceptibility independent variable (correlate). This variable was measured using an 8-item short form version of the Center for Epidemiologic Studies Depression Scale (CES-D). While the CES-D alone is not a diagnostic instrument for depression, it reliably measures depression symptomatology across diverse ethnic groups, including Mexican Americans (Black et al., 1998; Neaigus et al., 2006; Ostir et al., 2003; Roberts, 1980). After dichotomizing the items, scores of 7 or higher were deemed to be indicative of clinically significant levels of depressive symptoms (Melchior et al., 1993). Acculturation was also conceived as a key variable in the individual susceptibility domain. It was measured using the 12-item Short Acculturation Scale that assesses modification in values, norms, attitudes and behaviors as a result of exposure to mainstream cultural patterns (Marin et al., 1987). A cut-off score of 2.99 or less indicates a lesser-acculturated individual. Other variables in the individual susceptibility domain included measures of lifetime experiences with sexual abuse, physical abuse, suicide ideation and suicide attempt. These independent variables were selected based on existing literature that documented a relationship with drug use and depression (Gilbert et al., 1997; Vega et al., 1998).

Specific drug use behaviors were also conceived to be independent variables in the individual susceptibility domain that hypothetically correlate with heroin injecting transition risk. These variables included past month prevalence of sniffing cocaine and smoking crack. The use of cocaine and crack has been documented to be significantly associated with the transition to heroin injection (Ameijden et al., 1994; Roy et al., 2003). Participants were also asked about the HIV related risk behavior of ever having shared implements while sniffing with others. Two variables related to the theoretical domain of risk networks were

hypothetically posited as correlates of heroin injecting transition risk: used non-injecting heroin with a current or former injector and ever had sex with a current or former injector.

Selected variables in the socio-demographic and individual background domain were also included in the analysis. Variables included: gender; age; education; work status; family in which the respondent had their own, foster, step or adopted children; lifetime incarceration and monthly income.

2.3 Data Analysis

The data analysis in this study is limited to the baseline interview. The conceptual framework in Figure 1 guided the data analysis. A logistic regression analysis approach developed in the prior studies of the sample was applied (Valdez et al., 2008a; 2007, 2011). For the purpose of the logistic regression analysis, continuous independent variables were recoded as dichotomies based on an examination of their distributions. In the first step of the analysis, a diagnosis of the frequency distributions of all study variables was conducted to ensure their sufficient variability. The second step involved a bivariate analysis of the key independent variable depression symptomatology and sociodemographic and acculturation variables. The purpose of this bivariate analysis was to better understand the interrelationships between these independent variables in order to inform the construction of the multivariate logistic regression models. The Pearson chi-square test was used to determine statistical significance in the bivariate analysis (<0.05 level of significance). In the third step of the analysis, depression symptomatology and all other independent variables were entered in successive univariate logistic regression models determining heroin injecting transition risk. Crude odds ratios were calculated. The final step of the analysis involved the selection of the significant variables ($p<0.05$) found in the univariate logistic regression analysis for inclusion in a multivariate logistic regression model that determined heroin injecting transition risk. In the multivariate logistic regression model age and gender were first stepped into the model as control variables followed by a block of the independent variables adjusted by the control variables. Adjusted odds ratios (AOR) and 95% confidence intervals (CI) were then estimated. For the test of moderation, the main effects of the independent variables including depression and acculturation were controlled and an interaction term (depression x acculturation) was stepped in the final block of the logistic regression model.

3. Results

3.1 Percentage Distribution of Study Variables

Table 1 shows the percentage distributions in the sample of the study variables in the posited theoretical domains. The socio-demographic and individual background variables indicated that the sample was predominately male (66%) and equally distributed on age. Females were significantly older than males as determined by a supplemental chi-square test ($\chi^2 4.46 =, p < .035$). Over half (56%) of the sample reported being single with 44 percent in marital relationships including common law arrangements (31%). Three-quarters (75%) were unemployed and 63 percent reported incomes ranging from 0 to \$999 in the past 30 days. Almost two-thirds (61%) of the sample were in a family in which they were a parent of

children. More than half of the sample (58%) had been incarcerated for 3 days or more in their lifetimes.

The percentage distributions of the variables in both the individual susceptibility and social network influence domains generally show high variability in this ethnically homogeneous study sample. One-third (33%) of the sample endorsed that they had experienced clinically significant levels of depression and about the same percentage (35%) reported having suicide ideation. Sexual abuse was experienced by 16 percent and physical abuse by 14 percent of the sample. On drug behaviors categorized under individual susceptibility, current prevalence of smoked crack was 10 percent of the sample. On the other hand, sniffing cocaine in the past 30 days was reported by over half of the sample (53%). More than two-thirds (68%) of the sample has shared drug implements while sniffing heroin. The sample was predominantly highly acculturated with 70 percent scoring 3 on the Short Acculturation Scale. For the heroin and sex network with an IDU influence variables only 3 percent of the sample reported as having sex with an IDU while 24% said that they had used non-injected heroin with an IDU.

A wide range in scores was observed for individual scale items and the total heroin injecting risk scale score. For instance, a large proportion of the sample scored high on injecting transition risk (75%) while for the total Severity of Dependence scale only one-third (34%) scored high. Of the sample, 79 percent were never injectors and 21 percent were former injectors. Daily NIU heroin use was reported by 53 percent while weekly or monthly use by 46 percent. The duration of heroin use showed a similar distribution with 56 percent using heroin for 3 years or less and 44 percent using 4 years or more.

3.2 Bivariate Associations of Depression Symptomatology with Sociodemographic, Individual Background and Acculturation Variables

As presented in Table 2, higher levels of depression symptomatology were found to be associated with the sociodemographic characteristics of being female ($\chi^2 = 24.8$, $p < .001$) and 21 years of age or older ($\chi^2 = 5.8$, $p < .05$). The individual background variable having children was also found to be significant ($\chi^2 = 10.3$, $p < .01$). The association between depression symptomatology and acculturation was found not significant ($\chi^2 = 0.7$, $p = .40$).

3.3 Correlates of Heroin Injecting Transition Risk

In Table 3 the final summary results of the univariate and multivariate logistic regression analyses are presented. Only the independent variables found to be significantly related ($p < .05$) to injecting transition risk in the univariate analysis are shown in the table. In the univariate logistic regression, injecting transition risk was found to be significantly related to having children (OR=1.87, 95% CI=1.09, 3.22, $p < 0.05$), acculturation level (OR=.45, 95% CI=0.23, 0.90, $p < .05$), physical abuse (OR=3.17, 95% CI=1.09, 9.23, $p < .05$), suicide ideation (OR=2.57, 95% CI=1.35, 4.90, $p < .01$), using non-injecting heroin with a former or current injector (OR = 3.70 95% CI = 1.61, 8.53, $p < .01$), and having depression symptomatology (OR=3.32, 95% CI=1.65, 4.04, $p < .001$).

In the multivariate logistic regression model three variables were found to be independently and significantly correlated with heroin transition risk when adjusted for age and gender

control variables. Participants with depression symptomatology had more than 3 times the risk of transitioning to injecting than their non-depressed counterparts (AOR = 3.05, 95% CI = 1.34, 3.61, $p < .01$). Additionally, participants who used non-injected heroin with an injector were notably more than 2 times as likely than those who did not, to be at risk for transitioning (AOR = 2.74, 95% CI = 1.13, 6.65, $p < .05$). Acculturation level also was found to be a significant independent correlate as hypothesized, with persons with low levels more likely to be at risk for transitioning. (AOR=.44, 95% CI = 0.21, 0.95). However, the interaction term of acculturation by depression symptomatology was not significant in the final model (AOR=1.84, 95% CI = 0.28, 11.87, $p = .52$).

Not represented in Table 2, the control variables were both significant in the final multivariate logistic regression. Study participants who were 21 years or older were 2.26 times more likely to have high heroin transitioning risk than the younger group (95% CI=1.13, 4.51, $p < .05$). Gender was especially meaningful as expected. Though not significant in the univariate logistic regression (Crude OR = 1.29, 95% CI=.74, 2.29, $p = .369$), gender became highly significant in the multivariate logistic model. Males had 2.48 times the odds of scoring high on heroin injecting risk than females (95%CI = 1.20, 5.12, $p < .01$). This indicates that the significant independent correlates of heroin injecting transition risk act as suppressors of the gender effect. This finding highlights the significance of understanding the implications of how various risk factors function distinctly for males and females as correlates of heroin injecting transition risk.

4. Discussion

This study found a highly significant relationship between depression symptomatology and the risk for transitioning to injecting heroin use. This relationship suggests a possible pathway in this special population of Mexican American NIUs that elevates their risk of contracting HIV/AIDS and other blood-borne pathogens via injecting practices. This risk has significant public health implications because it provides a vector for the spread of these infectious diseases once a virus is introduced in the population. This is exacerbated by the syndemic conditions of depression and heroin dependence within a highly impoverished context. As the experience of Eastern Europe documents, once the HIV virus was introduced among injecting drug users in a similar context it spread rapidly through the population reaching epidemic proportions (Gyarmathy et al., 2009; Platt et al., 2006; Rhodes et al., 1999).

Our study found that within the cultural and social context of Mexican American communities, low levels of acculturation were directly related to high heroin injecting transition risk. However, our findings also suggest that the hypothesis of acculturation moderating depression symptomatology is not supported by data from this sample. The strongest associations among the sociodemographic and individual susceptibility independent variables and depression symptomatology are being female, a family in which the respondent has children and being older (21 years and over). This suggests that the impact of family within this population may be influenced by specific cultural values (e.g. *familismo*, *marianismo*). These cultural values may exacerbate drug use among women, especially for those involved in a life style associated with heroin use. That is, behaviors

such as involvement in criminal and illegal activities associated with this lifestyle may be more in conflict with role expectations (female submissiveness, motherhood, etc.) among Mexican American females than males resulting in interpersonal distancing and separation (Nyamathi and Vasquez, 1995). Future research should investigate how the effects of culturally determined gender and family role conflicts experienced by drug using populations may result in specific social stressors that are contributing to injecting transition risk and other drug risk behaviors (Castro and Alarcon, 2002; Risser et al., 2010).

The findings in this study are consistent with other research supporting the network facilitation theory (Neaigus et al., 2006; Sherman et al., 2002; Valdez et al., 2008b). Mexican American NIUs involvement in mixed heroin use risk networks of NIUs and IDUs increases the risk of drug injecting practices. Specifically, a NIU who uses non-injecting heroin with a current injector is at high risk for transitioning. These findings underscore the importance of the characteristics of social networks in facilitating the transition to injecting drug use among NIUs.

The findings in this paper have some limitations. The main limitation of the study was that it was cross-sectional and we were not able to determine a causal relationship between drug use behaviors or depression. However, our findings begin to disentangle a complex relationship where both depression and injecting transition risk occur concurrently and may influence one another. That our data are based on self-reports may be seen as a shortcoming, however, self-reports have been found to have good reliability and validity in reporting HIV risk behaviors in previous research (McElrath et al., 1994; Neaigus et al., 2001b).

Finally, our findings provide specific challenges to service providers developing prevention and treatment strategies that target heroin users with comorbid behavioral health conditions. Getting NIU persons into drug treatment has been seen as one of the most effective ways of preventing the transition to injection (Gossop et al., 2004; Kelley and Chitwood, 2004). For those conducting street-based community outreach with out of treatment Mexican American NIU populations should recognize that there is a clear need for careful screening of depression symptomatology, especially at an early stage of their heroin careers. Moreover, service providers assessing the transition risk of NIU clients need to consider not only established diagnostic components of drug dependence, but also factors identified in our transition risk measure that are in a continual process of interaction with depression symptomatology. In conclusion, our study findings provide an understanding of how drug use and mental health comorbid conditions synergistically interact to potentially contribute to the spread of infectious diseases.

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Figure 1.
Conceptual model of variable domains used to predict heroin injecting transition risk.

Table 1

Percentage Distributions of Study Variables (N = 300)

Sociodemographic and Individual Background Independent Variables			
Gender (control)		Work Status	
Male	66	Unemployed	75
Female	34	Employed	24
Age (control)		Family	
20	50	No Children	38
21	50	Children	61
Marital Status		Incarceration	
Other	44	No	20
Single	56	Yes	58
Education		Income (Monthly)	
< HS grad	85	< \$1000	63
HS grad	14	\$1000	36
Individual Susceptibility Independent Variables			
Depression		Acculturation Level	
CES-D Score < 7	66	< 3 SAS	28
CES-D Score 7	33	3 SAS	70
Suicide Ideation		Suicide Attempt	
No	64	No	28
Yes	35	Yes	16
Sexual Abuse		Physical Abuse	
No	84	No	85
Yes	16	Yes	14
Smoked crack (past 30 days)		Sniffed Cocaine (past 30 days)	
No	23	No	34
Yes	10	Yes	53
Shared Implements while sniffing heroin			
No	32		
Yes	68		
Heroin Use and Sex Networks with IDUs Influence Independent Variables			
Sex with an injector		Used NIU Heroin with IDU	
No	78	No	72
Yes	3	Yes	24
Injecting Transition Risk Dependent Variable Scale Items			
Severity of dependence		Monthly NIU	
Score < 6	66	Monthly/Weekly	46
Score 6	34	Daily	53
Former injector		Duration of heroin use	

Never	79	3 years	56
Prior	21	4 years	44
<hr/>			
Injecting Transition Risk Dependent Variable Total Scale Score			
<hr/>			
Injecting Transition Risk			
Low Risk	23		
High Risk	75		
<hr/>			

Note: The percentage only reflects those participants that responded to the item

Table 2

Sociodemographic, Individual Background and Acculturation Variables Associated with Depression Symptomatology among Mexican American Non-injecting Heroin Users

	% CESD < 7 (n=199)	% CESD ≥ 7 (n=100)
Gender ***		
Female	24	53
Male	76	47
Age *		
20	55	40
21	45	60
Marital Status		
Other	56	55
Single	44	45
Education		
< HS grad	86	87
HS grad	14	13
Work Status		
Unemployed	74	80
Employed	26	20
Family **		
No Children	44	25
Children	56	75
Incarceration		
No	23	29
Yes	77	71
Income		
< \$1000	61	69
\$1000	39	31
Acculturation		
< 3 SAS	30	25
≥ 3 SAS	70	75

*
p < 0.05.,

**
p < 0.01.,

p < 0.001.

Table 3

Univariate and Multivariate Logistic Regression Models of Independent Variables related with the Dependent Variable Injecting Transition Risk among Mexican American Non-injecting Heroin Users (N = 300)

Variables	Crude OR (95% CI)	AOR (adjusted for age and gender) (95% CI)
Family		
No Children	1.00	1.00
Children	1.87* (1.09, 3.22)	1.41 (0.70, 2.86)
Acculturation Level		
High	1.00	1.00
Low	.45* (0.23, 0.90)	.44* (0.21, 0.95)
Physical Abuse		
No	1.00	1.00
Yes	3.17* (1.09, 9.23)	2.43 (0.75, 7.85)
Suicide Ideation		
No	1.00	1.00
Yes	2.57** (1.35, 4.90)	1.43 (0.66, 3.11)
Used NIU with an IDU		
No	1.00	1.00
Yes	3.70** (1.61, 8.53)	2.74* (1.13, 6.65)
Depression		
CES-D Score < 7	1.00	1.00
CES-D Score ≥ 7	3.32*** (1.65, 6.67)	3.05** (1.34, 6.94)

*
p < 0.05.,

**
p < 0.01.,

p < 0.001.