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Health Consequences of Long-Term Injection Heroin Use Among Aging Mexican American Men

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Abstract

Objectives—Research on the health consequences of long-term injection drug use (IDU) is limited. This article examines these consequences among aging, male Mexican American injecting heroin users. Concern for this group is crucial, given its health disparities and the association of IDU with disease transmission.

Method—Aging, male Mexican American IDUs (N = 227) were recruited through intensive outreach. Participants self-reported health status, medical and substance use history, and completed behavioral and psychometric health scales. Results are compared to Hispanic national samples.

Results—Participants had significantly poorer self-rated health and negative health conditions. Selected medical conditions not associated with the heroin-use lifestyle (i.e., hypertension, diabetes, arthritis) were lower relative to the comparison samples.

Discussion—This population has a complex profile of health consequences linked to a heroin-using lifestyle. The study concludes that routine screening of infectious diseases and medical and behavioral conditions among aging substance using populations may contribute to reducing Hispanic health disparities.

Keywords

aging; Mexican Americans; heroin; health; injection drug use (IDU)

Introduction

The number of older adults seeking treatment for marijuana, cocaine, heroin, and other drugs has increased dramatically in the past 10 years (Boddiger, 2008; Gfroerer, Penne, Pemberton, & Folsom, 2002). As a result, during the next decade, the number of individuals aged 50 and older in need of substance abuse treatment will double to almost 6 million (Han, Gfroerer, Colliver, & Penne, 2009; Substance Abuse and Mental Health Services Administration, Office of Applied Studies [SAMHSA], 2009). Much of this growth has been fueled by the baby boomer generation, a cohort with a history of a high prevalence of illicit drug use (Boeri, Sterk, & Elifson, 2008; Han, Gfroere, & Colliver, 2009). In spite of these

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shifts, knowledge of illicit drug use and its health consequences in older adults remains limited (Boeri et al., 2008; Rosen, 2004). In particular, there is limited knowledge on the health consequences of injection drug use (IDU) among aging cohorts such as Mexican Americans.

As injection heroin users age, they are confronted by many of the same health and social problems as other aging groups. However, expected age-related physiological, psychological, and social changes are compounded by the detrimental effects of illicit drug use, resulting in far greater morbidity and mortality for aging heroin users than for the general aging population (Alter et al., 1999; Hser, et al., 2004; SAMHSA, 2009). Substance abusing older adults in general, and aging injection drug users in particular, are a vulnerable population, at increased risk for HIV/AIDS and other blood-borne and sexually transmitted infections (Anderson & Levy, 2003; Boeri et al., 2008). Drug users have extensive acute and chronic health problems as a direct result of their drug use, homelessness, poor nutrition, and compromised immune systems (Dettmeyer, Friedrich, Schmidt, & Madea, 2009; Devlin & Henry, 2008; Friedman & Eisenstein, 2004). Poor health conditions and high morbidity are pervasive among aging injection heroin users, and the impact of poor health among long-term heroin users may have serious societal consequences.

For Mexican American males, these concerns are especially warranted. Compared to other groups in the United States, Mexican American drug users have traditionally had high rates of injection heroin use and AIDS-risk behaviors (Bullington, 1977; Desmond & Maddux, 1984; Estrada, 1998; SAMHSA, 1997). Moreover, given Hispanic health disparities, attention to the needs of aging Mexican American heroin users is critical. For example, Hispanics experience more age-adjusted years of potential life lost prior to age 75 per 100,000 population than non-Hispanic Whites for stroke, chronic liver disease and cirrhosis, diabetes, HIV, and homicide; have significantly lower rates of persons below 65 years of age with health insurance (66% Hispanics vs. 87% non-Hispanic Whites) or a regular source of ongoing health care (77% vs. 90%); and have higher rates of tobacco use than non-Hispanic Whites (Centers for Disease Control and Prevention [CDC], 2004a).

Given these factors, we must gain a deeper understanding of the health conditions and needs of aging injection heroin users if we are to successfully respond to the predicted epidemic of older drug users (Boeri et al., 2008). This article examines the physical and behavioral health consequences of long-term injection heroin use in a cohort of aging Mexican American men recruited through intensive outreach methods. Self-reported physical health, medical conditions, rates of substance use, and other behavioral health measures are reported. We then compare our sample's rates to age- and gender-adjusted general population samples of Mexican Americans and Hispanics drawn from two national studies that used probability samples.

Method

Study and Sampling Design

Research design and recruitment—Our study employed a cross-sectional research design and a field-intensive outreach methodology. Trained outreach specialists familiar with the target communities (discussed below) recruited Mexican American men ages 45 and older, with a history of injection drug use for at least 3 years, and who were either current injectors, former injectors not in treatment, or former injectors enrolled in methadone maintenance treatment programs.

Study participants received US$40 for completing a 2–3 hr semistructured interview. Participants also referred additional individuals into the study via a voucher system. At the

conclusion of their interview, participants were given two vouchers to pass on to two other individuals who met three criteria: Mexican American self-identification, age 45 and older, and with a history of long-term heroin use. If the individuals receiving the vouchers from the study participant followed through (i.e., contacted the study team, met inclusion criteria, and completed the interview) the referring participant received an additional US$10 finder's fee for each. To ensure that participants came from a broad range of networks, each referral chain was stopped after three links. The final sample included 227 Mexican American men. Complementing the quantitative data, ethnographic interviews were conducted on a subset of participants ($N = 60$). These interviews collected in-depth qualitative data on domains important in drug abuse research, including medical history, familial, social, contextual, and cultural domains. The University of Houston's Committee for the Protection of Human Subjects (CPHS) approved all study protocols.

Research site—Recruitment focused on Southeast Houston, a predominantly Mexican American area with high rates of poverty and psychosocial strife. The Houston metropolitan area has a population of approximately 5.8 million people (U.S. Census Bureau, 2010). The city of Houston, with a population of 2.02 million, is the fourth largest city in the country and one of the most culturally and ethnically diverse. Hispanics comprise 42% of the Houston population, whereas persons of Mexican origin are 27% of the Houston population and 62% of all Houston Hispanics (U.S. Census Bureau, 2009). Houston's proximity to Mexico—only 5 hrs from the border—and its designation as a major transportation, industry, and commercial hub, ensures a steady and high flow of movement of people between Mexico and Houston.

Recruitment of our sample focused predominantly on two geographic areas: Houston's South East and North sides. The South East consists of several distinct districts that include Denver Harbor, East End (Idylwood and Country Club), and Magnolia. Magnolia is 91% Hispanic, Denver Harbor 66%, and Idylwood/Country Club 49%. The North side of Houston, where the second largest proportion of Mexican Americans reside, is situated immediately adjacent to Downtown and is over 83% Hispanic. Both areas have high underclass characteristics, including the highest concentration of poverty (more than 40%) in the city of Houston (City of Houston Planning and Development Department, 2004) and high rates of high school dropout, male unemployment, households receiving public assistance, and female-headed households (Valdez, Kaplan, & Curtis, 2007). These Mexican American communities tend to be socially isolated enclaves highly protective of its members and closed to individuals from other communities (Valdez, Neaigus, & Kaplan, 2008).

Study Participants

Basic demographics—The sample ranged in age from 45 to 80, with a mean age of 55.14 years ($SD = 8.27$). Most (98.2%) were U.S. born and primarily English speaking (51.9%) or bilingual English–Spanish speakers (45.4%). Most (82.4%) did not complete high school. Half (49.4%) were separated or divorced, a quarter (24.7%) single, and one in five (22.0%) married. A third (33.5%) reported working, a third (32.6%) were unemployed, and a quarter (23.8%) disabled. Most (85.9%) had stable living arrangements.

Incarceration history—All participants had a history of incarceration, with a mean of six incarceration episodes ($M = 6.10$, $SD = 5.72$). Most (81.5%) reported having been incarcerated for longer than a year, with a mean of 10 years of incarceration during their lifetime ($M = 9.79$, $SD = 9.05$). Half the sample (50.2%) spent 8 or more years in prison, and a quarter (26.4%) spent between 15 and 43 years of their life incarcerated.

Heroin-use history—Average age of first heroin use was 19 (M = 18.93, SD = 5.98) and over half (55.9%) used heroin for the first time at age 17 or younger. Most (91.6%) used heroin intravenously their very first time. Regular (defined as weekly) heroin use started on average at age 21 (M = 20.65, SD = 6.39), within 2 years of first use for most participants. Duration of heroin use averaged 31 years (M = 31.15, SD = 11.54) and ranged from 4 to 61 years.

Lifetime drug use—Lifetime prevalence rates for alcohol, tobacco, and other drugs were high. Alcohol (99.1%), marijuana (98.2%), tobacco (96.9%), cocaine (91.1%), methadone (80.6%), and tranquilizers (80.1%) were the most commonly endorsed substances, followed by opiates other than heroin (66.9%), amphetamines (53.7%), and hallucinogens (51.5%). Less than half endorsed a lifetime history of inhalants (47.6%), crack (44.1%), PCP/Angel Dust (29.1%), noninjection heroin (20.3%), Ecstasy/MDMA (7.5%), or Ket-amine (0.9%).

Study Measures

Our survey instrument collected data on demographic variables, living circumstances, family trajectory and conflicts, illegal/criminal activities and incarceration, and comprehensive medical and sexual histories. Extensive coverage was given to substance-use history, including drug career trajectory, history of injection drug use, drug markets (e.g., access, availability, methods of purchase, and so on) and drug treatment history. We also collected detailed information about heroin-use trajectory, including circumstances surrounding initiation, midpoint, and time of last heroin use (e.g., persons involved, method of use, concurrent use of other substances, contextual factors, and medical complications). The survey instrument incorporated the following scales to measure health and behavioral health outcomes.

Health status self-report—Participants were asked to describe their health status along four response categories: Excellent, good, fair, and poor. This format is widely used to measure general health in both epidemiological and community-based research (Banerjee, Perry, Tran, & Arafat, 2010). Additionally, participants were asked “have you ever been told by a physician or another health professional that you have . . .” and presented with a list of medical conditions including arthritis, diabetes, hepatitis B and C, hypertension, skin abscesses, stroke, and various sexually transmitted infections. Health insurance status was also ascertained.

Center for Epidemiological Studies Depression Scale (CES-D)—The CES-D (Fischer & Corcoran, 2007; Radloff, 1977) measures depressive feelings and behaviors within the past week through 20 self-report items that tap into various domains of depressive symptomatology (e.g., “I felt sad”). Items are answered on a 4-point Likert-type scale from 0 (“rarely or none of the time/ less than one day”) to 3 (“most or all of the time/5–7 days”). Four positively-stated items (e.g., “I felt hopeful about the future”) are reversed-scored. Scores range from 0 to 60, with higher scores indicating more symptomatology and scores above 16 considered at risk for clinical depression. The CES-D has very good internal consistency, with Cronbach’s alphas around .85 for general populations and around .90 for psychiatric populations (Fischer & Corcoran, 2007). The alpha in our study was .92.

General Health Questionnaire-28 (GHQ-28)—The GHQ-28 (Goldberg & Gaeter, 1997; Goldberg & Hillier, 1979) is a screener for psychiatric disorders and has been translated into dozens of languages. Alpha coefficients range from .78 to .95 (Jackson, 2007); in our study, the GHQ-28 has an alpha of .85. The 28 items are divided into four subscales: Somatic symptoms, anxiety/insomnia, social dysfunction, and severe depression. Participants are asked “how they have been feeling lately,” and are then presented with

items assessing general malaise and specific symptoms associated with the four subscales (e.g., “feeling run down and out of sorts,” “lost much sleep over worry,” and “thinking of yourself as a worthless person”). Responses are on a 4-point Likert-type scale where 0 is *not at all*, 1 is *no more than usual*, 2 is *rather more than usual*, and 3 is *much more than usual*, for a possible range of 0 to 84. Scores above 23 are considered to be at risk for a psychiatric diagnosis (Goldberg & Gaeter, 1997; Goldberg & Hillier, 1979).

Perceived Stress Scale (PSS)—The PSS (Cohen, Kamarck, & Mermelstein, 1983) measures the degree to which individuals appraise events in their lives as stressful. Participants are asked to reflect on how often they have experienced certain feelings and thoughts during the last month, and presented with 10 items that are scored on a 4-point Likert-type scale from 0 = *never* to 4 = *very often*. Items deal with events that might be perceived as stressful and thus could increase the risk of health problems (e.g., being “upset because of something that happened unexpectedly”). Four items (4, 5, 7, and 8) are positively stated (e.g., feeling “confident about your ability to handle your personal problems”) and must be reversed score. The 10 items are then summed for a range of 0 to 40, with higher scores indicating greater levels of perceived stress. Internal consistency is good, with an alpha of .78 (Fischer & Corcoran, 2007); we obtained an alpha of .91.

Severity of Dependence Scale (SDS)—The SDS (Gossop et al., 1995) is a 5-item questionnaire that measures the severity of dependence on opioids during the last 30 days. The first four items (i.e., “did you think that your heroin use was out of control”; “did the thought of missing a fix make you anxious or worried”; “did you worry about your heroin use”; and “did you wish you could stop using heroin”) are answered on a 4-point Likert-type scale where 0 = *never* or *almost never*, 1 = *sometimes*, 2 = *often*, and 3 = *always or nearly always*. For the fifth item (“how difficult do you think it would be to go without heroin”), participants are asked to indicate whether their response is 0 = *not difficult*, 1 = *quite difficult*, 2 = *very difficult*, or 3 = *impossible*. The scale is summative, and higher scores indicate a more severe level of dependence (Gossop et al., 1995). A score of 3+ is highly indicative of a *Diagnostic and statistical manual of mental disorders* (4th ed.; DSM-IV; American Psychiatric Association, 1994) diagnosis of substance dependence (Ferri, Marsden, de Araujo, Laranjeira, & Gossop, 2000; Gonzalez-Saiz et al., 2009; Gossop et al., 1995; Kaye & Darke, 2002). Internal consistency is good, with an alpha of .89 (Gossop, Best, Marsden, & Strang, 1997); in our study, the alpha is .83. As our sample included current and former heroin users, we asked current users to focus on the last 30 days and former users to think about the 30 days preceding their last heroin injection.

Data Analysis

Initial data analyses were descriptive and univariate. We conducted reliability analyses for each scale using Cronbach’s alpha (reported above), examined all scores for outliers and statistical assumptions, and calculated means and standard deviations for continuous variables and percentages for categorical variables. To compare our participants’ percentages of self-described health, medical conditions, health insurance coverage, and prevalence of substance use with national norms for Hispanics, we used two nationally representative epidemiological surveys. These are Wave 1 (2001–2002) of the National Institute on Alcohol Abuse and Alcoholism’s National Epidemiologic Survey on Alcohol and Related Conditions (NESARC; Grant & Dawson, 2006); and the 2008 National Household Survey on Drug Use and Health (known prior to 2002 as the National Household Survey on Drug Abuse; SAMHSA, 2008). We chose these two national surveys for three key reasons. First, they were designed specifically to generate population-level prevalence estimates of use of substances and other health conditions. Second, they contain large Hispanic samples and can generate age- and gender-adjusted estimates for Mexican

Americans (NESARC) and Hispanics (NHSDUH). Finally, they employ a similar format to the one we used in our survey instrument to obtain Health Status Self Report, medical conditions, and prevalence of alcohol, tobacco, and other drugs.

However, differences in sampling strategies between our study, the NESARC, and the NHSDUH make it impossible to combine the three data sets. As a result, we are unable to directly control for potential individual-level correlates while comparing rates of substance use and medical comorbidities. Instead, using the raw data we computed prevalence estimates and standard errors for all three samples separately; compared the data sets two at a time (i.e., our data vs. the data on Mexican American men 45 to 80 in the NESARC; and our data vs. the data on Hispanic men 50 and older in the NHSDUH); transformed the differences in prevalence estimates to z scores; and computed the probability of obtaining a significant z score. This method of combining standard errors is less conservative than the method of using nonoverlapping 95% confidence intervals (Pirkis, Irwin, Brindis, Patton, & Sawyer, 2003; Torres, Peña, Westhoff, & Zayas, 2008) but will still give a correct alpha value of .05.

Finally, for our behavioral health measures (CESD-D, GHQ-28, PSS, and SDS), we obtained scale and subscale (where appropriate) scores using the proper calculations, and computed measures of central tendency and dispersion as well.

Results

Our results are presented in the following order. First, Table 1 presents the results of comparing our participants' self-described health status, medical conditions, and health insurance status to the age- and gender-adjusted Mexican American sample in Wave 1 of the NESARC, and to the age- and gender-adjusted Hispanic sample of the NHSDUH (from here on referred to as the NESARC and NHSDUH subsamples). The table groups medical conditions into four domains: Liver diseases, sexually transmitted infections (STIs), cardiovascular diseases, and other medical conditions. Table 2 then reports the current (past 30-day) prevalence rates for alcohol, tobacco and illicit drugs for our sample, compared to the NESARC and NHSDUH subsamples. Finally, the results of our behavioral health measures are presented in narrative form.

Self-Described Health Status

In response to the question *How would you describe your health status?* very few of our participants (4.8%) responded "excellent," over a quarter (27.8%) replied "good," almost half (49.3%) described it as "fair," and 17.2% stated it was "poor." The NESARC and NHSDUH subsample's percentages were, respectively, 42.8% and 34.8% "excellent"; 29.7% and 41.8% "good"; 18.3% and 16.8% "fair"; and 8.5% and 6.5% "poor." These differences are all highly significant ($p < .001$).

Medical Conditions

The first two domains (liver diseases and STIs) are more prevalent in drug-using populations and more closely tied to drug-using behaviors and risks. The remaining two domains include general medical conditions (with the exception of skin abscesses, which we included under other medical conditions but are more prevalent among injection drug users).

Liver diseases and STIs—Over half (55.1%) of our participants have hepatitis C, whereas 9.7% have been diagnosed with Cirrhosis and 7.9% with hepatitis B. In contrast, the percentages for the NESARC subsample were 0.5% for Cirrhosis and 1.0% for all other liver diseases. In the NHSDUH subsample, the prevalence of Cirrhosis was 0.0%, and 3.3%

for all types of hepatitis combined. These differences are all highly significant ($p < .001$). Our participants also reported high rates of gonorrhea (20.7%) and syphilis (11.5%), compared to 1.6% for all STIs in the NHSDUH subsample, a highly significant difference ($p < .001$; the NESARC did not collect data on STIs).

Cardiovascular diseases and other medical conditions—A quarter (25.6%) of our participants reported being diagnosed with hypertension, compared to 26.8% in the NESARC subsample ($p < .05$) and 28.4% in the NHSDUH subsample ($p < .001$). For stroke, the figure is 4.0% in our sample and 1.1% in the NHSDUH subsample ($p < .001$; the NESARC does not have data on stroke). For other medical conditions, 13.7% of our sample reported diabetes, compared to 18.0% in the NHSDUH subsample ($p < .001$; the NESARC did not ask about diabetes in Wave 1). Only 11.0% of our sample reported being diagnosed with arthritis, compared to 18.6% in the NESARC subsample ($p < .001$; the NHSDUH did not ask about arthritis). A small percentage of our sample (7.5%) endorsed skin abscesses, a condition prevalent in long-term injection drug users; neither comparative data set asked about skin abscesses.

Health Coverage

As shown in Table 1, almost one third (31.3%) of our sample has no health insurance coverage, compared to 25.0% in the NESARC subsample ($p < .001$) and 20.1% in the NHSDUH subsample ($p < .001$).

Alcohol, Tobacco, and Other Drug Use

As seen in Table 2, almost three quarters (71.8%) of our sample endorsed tobacco use in the past 30 days, compared to 21.9% in the NESARC subsample ($p < .001$) and 18.5% in the NHSDUH subsample ($p < .001$). Our sample had lower 30-day alcohol use than the NESARC subsample (59.9% vs. 65.4%, $p < .001$) but higher than the NHSDUH subsample (59.9% vs. 42.9%, $p < .001$). Forty percent (40.5%) of our participants endorsed methadone use in the last 30 days, compared to 0.0% in the NHSDUH subsample ($p < .001$; the NESARC did not ask about methadone use).

Almost half (43.2%) of our sample endorsed injection heroin use in the prior 30 days, compared to 0.0% in the NESARC and NHSDUH subsamples ($p < .001$). Significantly more participants in our study endorsed past-month use of marijuana (21.1%), crack (14.5%), and cocaine (14.1%), compared to the subsamples in the NESARC (0.3%, 0.0%, 0.0%) and the NHSDUH (0.5%, 0.0%, 0.0%; all $p < .001$). As well, significantly more participants in our study endorsed past-month use of tranquilizers (10.1%), noninjection heroin (6.2%), other opiates (2.6%), amphetamines (1.3%), and inhalants (0.4%), compared to the subsamples in the NESARC (all 0.0%) and the NHSDUH (all 0.0% except 1.1% for amphetamines and 0.5% for tranquilizers; all differences $p < .001$).

Behavioral Health Measures

On our measure of depressive symptomatology (the CES-D), our sample obtained a mean score of 12.99 ($SD = 10.32$) and over a third (34.4%) scored above 16, indicating a positive screen for depression. On the GHQ-28, our sample obtained a mean total score of 17.82 ($SD = 9.36$), with mean scores for the four subscales being 4.17 ($SD = 3.28$) for somatic symptoms, 4.07 ($SD = 4.48$) for anxiety and insomnia, 8.11 ($SD = 3.48$) for social dysfunction, and 1.48 ($SD = 3.14$) for severe depression. A quarter of the sample (25.1%) scored at or above 23, indicating a high probability of meeting criteria for a psychiatric diagnosis. On the Perceived Stress Scale, our sample obtained a mean score of 13.63 ($SD = 7.55$). Finally, our sample obtained a mean score of 8.50 ($SD = 3.77$) on the Severity of

Dependence Scale. Most participants (89.4%) scored 3 or higher, indicating a diagnosis of substance dependence.

Discussion

Our study augments the scarce literature on the impact of long-term heroin use on the health of aging Mexican American men. Moreover, it supports previous findings that long-term heroin use in general, among Hispanics, and among Mexican Americans, has serious adverse health consequences that directly impact the individual drug user and pose serious public health problems for the communities in which IDUs reside (Appel et al., 2001; Galea et al., 2006; Hser et al., 2004; Martinez, Bluthenthal, Flynn, Anderson, & Kral, 2009). The adverse health effects of long-term injection heroin use are further compounded by high lifetime and current rates of alcohol, tobacco, and other substances.

Emerging from our data is a pattern of complex findings, some expected and some unexpected. For instance, only four of our participants reported being HIV+. This is consistent with other studies that report a low prevalence of HIV among Mexican American injection drug users (Martinez et al., 2009). HBV and HCV, however, are significantly higher in our sample than in the comparison national population samples. However, our sample's HBV (7.9%) and HCV (55.1%) rates are lower than rates reported in other studies of IDUs, which tend to range from 64% to 94% (Diaz et al., 2001; Grebely et al., 2008; Hser et al., 2004; Patrick et al., 2001). These findings need to be cautiously interpreted given that infections for our sample were self-reported.

Our sample's rates of STIs are also high. Almost a third of our sample endorsed a history of syphilis or gonorrhea, compared to 3.8% to 25.7% in other studies of long-term heroin users (Bernstein et al., 2006; Frost et al., 2006; Hser et al., 2004; Ross & Williams, 2001) and to a rate of less than 2% for all STIs in the NHSDUH comparative subsample. These high rates of STIs in our sample may be related to sexual behaviors associated with the context of the heroin subculture. For example, previous research on drug-using networks, including networks of injection drug users, have found elevated rates of high-risk sex behaviors such as sex-for-drugs exchanges (Baseman, Ross, & Williams, 1999; Ross, Hwang, Leonard, Teng, & Duncan, 1999; Ross & Williams, 2001; Valdez, Cepeda, Neaigus, & Russel, 2008). In addition, injection drug users are more likely to decrease risks associated with injecting behaviors, and less likely to decrease risks associated with sexual behaviors, as they age (Booth & Watters, 1994; Des Jarlais, Friedman, Choopanya, Vanichseni, & Ward, 1992). This is similar to the relatively increased high-risk sexual behavior among aging populations generally (Hillman, 2008; Karlovsky, Lebed, & Mydlo, 2004; Maes & Louis, 2003; Savasta, 2004).

With regard to self-reported health status, our sample's' pattern is generally the inverse of the comparative data. Only a third of our participants described their health as excellent or good, compared to three quarters of the comparative responses, while two thirds of our participants described their health as fair or poor, compared to a quarter of the comparative samples. This finding fits with existing knowledge of long-term heroin users, who tend to report withdrawal symptoms characterized by general malaise and a heightened sensitivity to physical discomfort (Bartter & Gooberman, 1996). Moreover, two thirds of our participants were either currently injecting heroin or enrolled in methadone treatment. Thus, at any given point in time, their self-perception of physical health could be adversely impacted by experiencing withdrawal. The addiction syndrome, as indicated by the Severity of Dependence Scale results, with most (89.4%) scoring at or above 3, supports this interpretation of the low self-rated health status of our study participants being impacted by drug-use status.

On our key measures of psychiatric symptomatology (CESD and GHQ-28), one third and one quarter of our participants, respectively, scored above cutoffs indicating a high probability of meeting criteria for a psychiatric diagnosis. Long-term heroin use and its associated lifestyle seems to be accelerating the onset of depression that appears in the general population of elderly Mexican Americans (Stimpson, Peek, & Markides, 2006; Chiriboga, Jang, Banks, & Kim, 2006; Kim, Chiriboga, & Jang, 2009). On the PSS, our sample's mean score of 13.63 is higher than PSS norms for U.S. males (12.1, $SD = 5.9$) and individuals 45 and older (12.1, $SD = 6.4$), and on par with norms for U.S. Hispanics (14.0, $SD = 6.9$; Cohen et al., 1983; Cohen & Williamson, 1998). Thus, while increased stress, depression, anxiety, insomnia, social dysfunction, and other psychiatric symptoms are not hallmarks of normal aging, high rates of these symptoms in our sample seem to indicate that the increased psychiatric morbidity seen in aging Mexican American men is further exacerbated by a drug-using lifestyle.

However, our sample is healthier than we would have anticipated with regard to medical conditions not typically associated with a substance-using lifestyle. The Mexican American men in our sample endorse significantly lower prevalence of high blood pressure, diabetes, and arthritis than the comparison samples. Our rates are also lower than those in other studies of long-term injection heroin users (Hser et al., 2004). Rates of diabetes in our sample (13.7%) are similar to or lower than rates for Texas Hispanics (13.0% in the 45–54 age group, 20.8% in the 55–64 age group, and 25.4% in the more than 65 age group) whereas rates of hypertension in our sample (25.6%) are similar to those for U.S. Mexican Americans (25.1%; CDC, 2004b, 2005).

What might partially account for the relatively good general health status of our sample is that these participants have had recent access to health care despite low rates of health insurance. In fact, 76.1% of participants stated they last received medical care less than 1 year ago. A third of the sample is currently in methadone treatment, where seeing a physician regularly is an integral part of their treatment regimen. In addition, many of our participants are veterans and receive treatment at the Veterans Affairs Medical Centers. Their current health status may also be explained by high rates of intermittent incarceration periods where they are likely to receive health care services.

Contextual and cultural factors might also be playing a role in the better than expected general health status of our sample. The tight-knit Mexican American communities and closed drug-using networks embedded in the Houston *barrios* may be protecting against the introduction of infectious agents such as HIV. Higher rates of HCV, HVB, and HIV in other studies of heroin users in California, New York, and other inner cities (Grebely et al., 2008; Hser et al., 2004; Kapadia et al., 2007) may be related not only to measurement variations, but also to the less isolated nature of those communities.

The results of our study need to be cautiously interpreted due to some methodological limitations. Although our sampling approach allows us to access an otherwise hidden population, it may also contribute to limited generalizabililty. Furthermore, as mentioned above, specific risk and protective factors may exist in Houston that also limit generalizabililty and need to be further examined. Our reliance on self-reported measures of medical conditions is likely to lead to more bias than would be the case if medical examinations and laboratory tests were also employed. Despite these limitations, our study contributes to broadening the understanding of the health consequences of long-term injecting heroin use in the Mexican American population by providing unique data from a community sample.

In conclusion, our findings support earlier studies of heroin addicts showing that continued use of drugs and its associated lifestyle, coupled with a depressed economic situation marked by poverty and lack of access to material resources, complicates the aging process for these men (Bourgois et al., 2006; Desmond & Maddux, 1984; Hser et al., 2004). Our study adds to the growing call (Boddiger, 2008) to implement systematic screening of infectious diseases, behavioral health indicators, and general medical conditions in aging injection drug users, even after injection drug use has ceased.

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Table 1

Self-Described Health Status, Medical Conditions, and Health Insurance Coverage in Aging Mexican American Heroin Using Men and Age- and Gender-Adjusted Prevalence for U.S. Mexican Americans and U.S. Hispanics

	Study sample (*N* = 227)		NESARC W1 (*N* = 575)			NHSDUH (*N* = 184)		
Domain	**%**	***SE***	**%***a***	***SE***	**Z value**	**%***b***	***SE***	**Z value**
Self-described health status								
Excellent	4.8	0.464	42.8	0.047	−81.479***	34.8	0.065	−64.030***
Good	27.8	0.464	29.7	0.047	−4.074***	41.8	0.065	−29.881***
Fair	49.3	0.464	18.3	0.047	66.470***	16.8	0.065	69.366***
Poor	17.2	0.464	8.5	0.047	18.655***	6.5	0.065	22.837***
Liver diseases								
Hepatitis C	55.1	0.816	1.0	0.045	66.198***	3.3	0.013	63.472***
Cirrhosis	9.7	0.339	0.5	0.044	26.913***	0.0	0.000	28.614***
Hepatitis B	7.9	0.585	1.0	0.045	11.760***	3.3	0.013	7.861***
Sexually transmitted infections								
Gonorrhea	20.7	0.339	N/A	N/A	N/A	1.6	0.009	56.322***
Syphilis	11.5	0.339	N/A	N/A	N/A	1.6	0.009	29.193***
Cardiovascular diseases								
High blood pressure	25.6	0.584	26.8	0.053	−2.047*	28.4	0.033	−4.789***
Stroke	4.0	0.339	N/A	N/A	N/A	1.1	0.008	8.552***
Other medical conditions								
Diabetes	13.7	0.339	N/A	N/A	N/A	18.0	0.028	−12.627***
Arthritis	11.0	0.339	18.6	0.049	−22.188***	N/A	N/A	N/A
Skin abscesses	7.5	0.339	N/A	N/A	N/A	N/A	N/A	N/A
No health insurance coverage	31.3	0.031	25.0	0.018	175.747***	20.1	0.030	259.624***

Note. NESARC = National Epidemiologic Survey on Alcohol and Related Conditions, NHSDUH = National Household Survey on Drug Use and Health.

a. National Institute on Alcohol Abuse and Alcoholism, National Epidemiologic Survey on Alcohol and Related Conditions, Wave 1 (2001–2002), Mexican Americans.

b. National Household Survey on Drug Use and Health, 2008, Hispanics.

* $p < .05$.

** $p < .01$.

*** $p < .001$.

Table 2

Past Month Prevalence of Alcohol, Tobacco, and Other Drugs in Aging Mexican American Heroin Using Men and Age- and Gender-Adjusted Prevalence for U.S. Mexican Americans and U.S. Hispanics

	Study sample (*N* = 227)		NESARC W1 (*N* = 575)			NHSDUH (*N* = 184)		
Substance	**%**	***SE***	**%*a***	***SE***	**Z value**	**%*b***	***SE***	**Z value**
Tobacco	71.8	0.030	21.9	0.033	1118.88***	18.5	0.029	1277.403***
Alcohol	59.9	0.033	65.4	0.029	−125.194***	42.9	0.037	342.892***
Methadone	40.5	0.033	N/A	N/A	N/A	0.0	0.000	1227.273***
Heroin (injection)	43.2	0.040	0.0	0.000	1027.273***	0.0	0.033	1027.273***
Marijuana	21.1	0.027	0.3	0.002	768.266***	0.5	0.005	750.208***
Crack	14.5	0.023	0.0	0.000	630.435***	0.0	0.000	630.435***
Cocaine	14.1	0.023	0.0	0.000	613.043***	0.0	0.000	613.043***
Tranquilizers	10.1	0.020	0.0	0.000	505.000***	0.5	0.005	465.668***
Heroin (noninjection)	6.2	0.016	0.0	0.000	387.500***	0.0	0.000	387.500***
Other opiates	2.6	0.011	0.0	0.000	236.364***	1.1	0.008	110.282***
Amphetamines	1.3	0.008	0.0	0.000	162.500***	0.0	0.000	162.500***
Inhalants	0.4	0.004	0.0	0.000	100.000***	0.0	0.000	100.000***

Note. NESARC = National Epidemiologic Survey on Alcohol and Related Conditions, NHSDUH = National Household Survey on Drug Use and Health.

a. National Institute on Alcohol Abuse and Alcoholism, National Epidemiologic Survey on Alcohol and Related Conditions, Wave 1 (2001–2002), Mexican Americans.

b. National Household Survey on Drug Use and Health, 2008, Hispanics.

* $p < .05$.

** $p < .01$.

*** $p < .001$.