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# Association between health status and homeless chronicity among individuals attending community-based organizations in San Juan, Puerto Rico

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**Advisors' Certification**

We certificate that the research project titled "Association between health status and homeless chronicity among individuals attending community-based organizations in San Juan, Puerto Rico" performed by Sheyla Garced Tirado and presented in this document, meets the requirements for the degree of Masters in Science of Epidemiology of the Department of Biostatistics and Epidemiology of the University of Puerto Rico Graduate School of Public Health, Medical Sciences Campus.

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## Dedicatory

This work is dedicated to improve the well being of all those participants that regardless of being marginalized and discriminated, contributed without hesitation to this study and taught me great lessons along the way.

"The biggest disease today is not leprosy or tuberculosis, but rather the feeling of being unwanted".

*Mother Teresa of Calcutta*

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## Abstract

**Background:** Homeless populations have disclosed in many studies their particular needs of health care services, histories of hospitalization, chronic health conditions and mental illnesses. This study assessed the physical and mental health status across residential status of individuals attending community-based organizations (CBOs) in San Juan, Puerto Rico (PR). **Methods:** We performed a cross-sectional survey of 100 individuals aged 21-82 years enrolled in two CBOs that offer services to homeless in San Juan, PR. Face-to-face interviews collected information on socio-demographics, substance use, and access to medical care. The SF-36 Health Survey version 1.0 was administered to assess health status providing eight norm-based subscales, a Physical Component Summary (PCS) and a Mental Component Summary (MCS). Scores at or below the median were defined as poor physical or mental health status. Multiple logistic regression models were estimated to evaluate the association between health status and homeless chronicity. Models for PCS and MCS were generated separately and adjusted prevalence odds ratios (POR) were calculated. **Results:** Residential status was distributed as follows: 56.0% on-the-street homeless, 9.0% transitionally-housed and 35.0% housed. Mean PCS and MCS scores were 49.6±11.8 and 42.2±14.4, respectively. MCS unadjusted POR for on-the-street and transitionally homeless individuals were 2.88 (95% CI: 1.22-6.77) compared to housed individuals. PCS unadjusted POR for on-the-street and transitionally homeless individuals were 1.58 (95% CI: 0.56-4.43) compared to housed individuals. After adjusting for polydrug use and CBO as a random intercept, on-the-street and transitionally homeless were 2.57 (95% CI: 1.07-6.17) times more likely to have a poor mental health status than housed individuals. After adjusting for HIV,

anxiety disorder and CBO as a random intercept, on-the-street and transitionally homeless were 1.27 (95% CI: 0.52-3.11) times more likely to have a poor physical health status than housed individuals. **Conclusions:** These findings underscore the need for more aggressive prevention and treatment programs targeting homeless adults in San Juan, PR.

# Chapter 1: Introduction

## 1.1. Introduction

Public health faces the tremendous challenge of homelessness. Not only is this situation alone complex, but very likely to interconnect with other problems like physical and mental health conditions, drug use and other negative health-related outcomes.

Homelessness is defined by residential status as either transitionally housed (living with friends, family or others) or on-the-street homeless (living on the street or in a shelter) (Reyes et al., 2005). It has been estimated that in 2005 nearly 8,418 homeless lived in PR, of which, 27% lived in San Juan (Children and Family Department of Puerto Rico, 2005; Commission for the Implantation of Public Policy for the Homeless). It is believed that this number is underestimated by almost three times (Ponce School of Medicine, 2006). Recently, this went up to 12,543 homeless people in the metropolitan area (ASSMCA, 2007). This population is not only affected by homelessness but by substance abuse and multiple comorbidities. This data also revealed that 50.8% were substance abusers, 23.5% mentally ill, and 2.7% infected with HIV. San Juan is shelter for the majority of the homeless population in the island and for 31% of the homeless drug users. Another report mentioned that 33% of their sample was chronically homeless, and 15% had been five times or more in the streets (Colón et al., 2007). More than half adjudged loosing their homes to substance dependence (51%) and 20% to domestic violence. In PR, homelessness has been documented as a risk factor for HIV seropositivity, sharing needles, injection-related HIV risk behaviors, engaging in back loading, sharing rinse water and dropping out of drug rehabilitation treatments (Reyes et al., 2005; Marrero et al., 2005). Indisputably, homeless individuals usually compose a

significant number in samples of other studies appraising substance users (Finlinson et al., 2006; Marrero et al., 2005; Colón et al., 2001; Robles et al., 2003; Robles et al., 1998).

The "drug of choice" among Puerto Rican homeless drug users has not been documented to be representative; nevertheless, some studies document it to be *speedball*, a mixture of heroin and cocaine (Reyes et al., 2005). The perception of a single drug of use is lagging behind new tendencies, and considerations towards this behavior are essential. The sole emphasis on either one drug of choice can blur the focus on the relatedness and synergistic effects of polydrug use. Polysubstance use can induce sensitization to the use of other drugs, negative health outcomes (Finlinson et al., 2006), increased risk of drug treatment dropout (Marrero et al., 2005), toxicity (Usdan et al., 2001), increased frequency of injection (Colón et al., 2001), association with lifetime methamphetamine use (Nyamathi et al., 2007) and benzodiazepine overuse (Griffiths & Weerts, 1997). Hence, the concept of *primary drug* turns to have a critical role for the comprehension of drug addiction. The primary drug is the one use predominantly by the individual, but not necessarily the only one. Other drugs can be used during the same period of the primary drug to modulate the effects of their primary drug (Finlinson et al., 2006). In a study done by Prithwish De and colleagues in 2007, subjects were deemed to be primarily cocaine or heroin injectors if either of these drugs was injected "half the time or more" during the past 6 months.

In this context, therefore, analysis of health-related outcomes co-occurring among this high risk population becomes critical. It has been demonstrated that homeless individuals have poorer health perceptions than the general population (Tsui et al., 2007;

Kertesz et al., 2005; Marrero et al., 2005; Reyes et al., 2005; Matos et al., 2004; Robles et al., 2003; Riley et al., 2003). Some studies show how quality of life can be affected by homeless chronicity even after adjusting for numerous covariates (Kertesz et al., 2005). Psychiatric disorders, substance dependence, HIV/HCV co-infections and other chronic diseases are factors that could impact health-related quality of life (Tsui et al., 2007; Kertesz et al., 2005; Riley et al., 2003).

Physical and mental health quality of life among homeless individuals has not been evaluated in PR. Therefore, this study aimed to evaluate residential status as a factor possibly associated with physical and mental health quality of life among adults that seek services in Community-Based Organizations (CBOs) offering services for homeless in San Juan, PR. The importance of this study not only resided in evaluating the association between health status and homeless chronicity, but in understanding the factors that underlie the coexisting relationship of both outcomes.

### 1.2. Health status and homelessness in the United States and Puerto Rico

Homeless adults in the United States (US) typically encounter the risk of developing physical incapacities that could limit their ability to obtain health care for conditions that are usually preventable. Despite the poorer physical and mental health of homeless, they are less likely than the general adult population to use outpatient medical services but more likely to be hospitalized (Gelberg et al., 2000). This could suggest that homeless people encounter major obstacles accessing needed medical services. One-fifth of surveyed homeless adults residing in New York City shelters reported a disease or disability that restricted their functioning (Barrow et al., 1999). A community-based

study done by Gelberg and colleagues (2000) of 363 homeless individuals indicated that 34.9% had a restricted activity during the past three months and 32.3% a functional limitation. These findings predicted the use of services in their sample. About 36% of the participants reported having skin, leg and foot problems, and restrictions associated to these problems were reported with more frequency because of this problem. In addition, this population can encounter problems like mental illness, victimization, other physical illnesses, and substance abuse that can affect health-related quality of life.

Substance use among homeless is a persistent problem across the US (Nyamathi et al., 2007; Colón et al., 2001; Usdan et al., 2001; Gelberg et al., 2000; Nyamathi et al., 2002; HCH, 2002). Underlying substance abuse can increase the vulnerability of homeless people to trauma and interfere with adherence to treatment of a concurrent illness. Among the same sample that reflected restricted activity and functional limitation, chronic drug dependence was a latent problem for 40.1% and chronic alcohol dependence for 59.2% (Gelberg et al., 2000). Substance abuse among homeless in the US has been documented for methamphetamine (Nyamathi et al., 2007; Nyamathi et al., 2002), benzodiazepines (Colón et al., 2001), alcohol (O'Toole et al., 2007; Nyamathi et al., 2007; Nyamathi et al., 2002; Usdan et al., 2001; Gelberg et al., 2000), and cocaine and heroin (O'Toole et al., 2007; Usdan et al., 2001; Nyamathi et al., 2002; Usdan et al., 2001; Colón et al., 2001). Other investigations remarked the fact that it is not only a problem of one type of drug use but a matter of polydrug use among homeless (Usdan et al., 2001; Colón et al., 2001; Nyamathi et al., 2007; Robles et al., 2003). This implies a more complex setting where the health-related factors are multiplied by the number of drugs consumed. A study done by Usdan and colleagues (2001) revealed that from a

sample of 141 homeless, 56.5% were polydrug users of cocaine and alcohol. As mentioned in their report, the combination of both alcohol and cocaine may enhance the toxic effect by the synthesis of a substance called cocaethylene, which develops in the liver as a response to the presence of both substances. Colón and colleagues also coincide that polydrug use was an existing problem of 800 Hispanic drug users (53.9% of cocaine and heroin) of which, 34.1% were homeless. A study done on a Hispanic population also revealed that 79% used more than two types of non-injected drugs and 37% more than two types of injected drugs in the past 30 days (Robles et al., 2003). Nyamathi reported that polydrug use among homeless was independently associated with lifetime use of methamphetamines (Nyamathi et al., 2007).

In PR, limited information is documented regarding physical and mental health quality of life among homeless. In a sample of 124 drug injectors (13% homeless) recruited for a study done by Marrero and colleagues (2005), individuals who scored less than 50 on the 36-Item Vitality sub-scale administered to assess functional status and well being were more than twice as likely to drop out of drug treatment as those scoring more than 50 (OR=2.21, p=0.23). Furthermore, those who perceived their health as fair or poor were almost twice as likely to drop out as those who perceived their health as good or excellent (OR=1.95, p=0.09). These outcomes could be indicative of a detrimental health-related quality of life in this population.

PR also suffers from the unresolved issue of homelessness and polydrug use. For the period of 2005, a sample of 557 intravenous drug users (IDUs) indicated that 92.7% of transitionally housed and 91.2% of on-the-street homeless used speedball (a mixture of heroin and cocaine) in the last 30 days (Reyes et al., 2005). As reported by the same

source, on-the-street homeless were more likely to be HIV seropositive and to report symptoms of severe anxiety than transitionally housed and housed IDUs. Marrero and colleagues also mentioned that besides finding a relationship with functional status and well being, those primary speedball users were over three times more likely to drop out than non-speedball users (OR=3.34, p=0.01) in the sample from PR. Colón and colleagues compared IDUs from Bayamón, PR versus New York, US and found a lower proportion of homelessness (34.1% in US vs. 23.2% in PR) and a higher proportion of injectors of speedball (53.9% in US vs. 91.1% in PR) in PR. They also highlighted the fact that injection of cocaine alone and injection of speedball were both found to increase the expected frequency of injection by about 30% in both samples. As they attempted to explain speedball's frequent use among their participants, the synergistic effects it has on the elevations of important neurotransmitters in the brain related to drug self-administration and reinforcement, could explain why speedball use was found to increase the frequency of injection in their sample after controlling for the effect of both heroin and cocaine injection. This same cohort analyzed in another study (Robles et al., 2003) revealed that of a sample of 334 drug users in Puerto Rico (18% homeless), 58% used more than two types of non-injected drugs and 60% more than two types of injected drugs in the past 30 days. An ethnographic study (Finlinson et al., 2006) of 25 recently drug injectors (21% homeless) of Puerto Rico indicated that, through the use of marijuana, 14% used crack cocaine or smoked cocaine (crushed crack or white powder) and 8% used heroin for the first time. These findings in the US and PR coincide with the observation that polydrug use, not only among homeless, interferes with adherence to drug treatment and engagement in health care services (Marrero et al., 2005), affects the

sensitization to the use of other drugs (Finlinson et al., 2006), increases the expected frequency of drug injections and relates to drug self-administration and reinforcement (Colón et al., 2001). Furthermore, polysubstance use may enhance toxicity (Usdan et al., 2001), associate with lifetime use of methamphetamines (Nyamathi et al., 2007), cause memory impairment (Stevens et al., 2007), enhance benzodiazepine use (Griffiths & Weerts, 1997), be associated with other negative health related outcomes (Finlinson et al., 2006), and require specialized detoxification treatment (Usdan et al., 2001). Most important, polydrug use could have an effect related to quality of life, activity restriction and functional limitations (Marrero et al., 2005; Gelberg et al., 2000), which was an important aspect to be considered in this study.

### 1.3. Justification of the study

Many researchers, as mentioned earlier, have described characteristics and needs of homeless individuals in Puerto Rico, but not necessarily the factors underlying the health-related quality of life of this population. The risks of developing any disability, specifically any physical incapacity while homeless, are issues that need to be addressed in the field of public health. People without homes are also at high risk for trauma, victimization, nutritional deficiencies, co-morbidities, and substance abuse problems that could either cause or exacerbate physical disabilities (Gelberg et al., 2000; HCH, 2002). Exposure to these factors can increase the likelihood that minor disabilities become serious functional impairments. In addition, little is known about the behaviors of this population nationwide, because they are usually excluded from national health surveys (NSDUH, 2006). Nonetheless, they have disclosed in many studies their particular needs

of health care services, poor health perception, histories of hospitalization, chronic health conditions and mental illnesses. This study investigated factors that could explain the association between health-related quality of life and residential status of those who seek services in CBOs in the municipality of San Juan, Puerto Rico. These findings could help plan adequate services for the complex comorbid conditions affecting homeless, which not only reside in substance abuse.

Exploring how polydrug use, health-related quality of life and residential status could unable homeless people to access health care services or adhere to drug treatment is a serious issue that can not be left unattended. A homeless polydrug user faces more obstacles in drug rehabilitation treatment due to possibly simultaneous use of other drugs, which were not the primary concern of the drug treatment (Williamson et al., 2006; Marrero et al., 2005); however, a poor physical and mental health, as an additional obstacle operating over, has not been considered as a risk factor. Activity restrictions and functional limitations can difficult an individual in executing activities and involvement in life situations (WHO, 2002), but this has not been analyzed as a function of substance abuse either, let alone in a homeless population. Not considering the biological processes underlying polydrug use could be detrimental in finding an association between health-related quality of life and residential status, speculating that the relatedness of drugs could be reflected in an individual's performance and capacity in executing activities. There is a need of looking carefully for other drugs of use being sold and consumed in places like San Juan. *Xylazine,* benzodiazepines and amphetamines are potential drugs of abuse commonly used and accessible, causing great damage and complications in the individual (Nyamathi et al., 2007; Griffiths & Weerts, 1997; Elejalde et al., 2003; Moore

et al., 2003; Carruthers et al., 1979; Spoerke et al., 1986; El Nuevo Día, 2005). This also needs to be evaluated when analyzing drug behaviors and polydrug use and misuse in future studies, because consumption is turning towards less restricted products. Therefore, the present study aimed to evaluate the association between health status and homeless chronicity among adults that seek services for the homeless in the municipality of San Juan, Puerto Rico. In addition, describing the homeless population that seeks services in San Juan and their risk behaviors is an essential step for planning of health care services and prevention programs.

# Chapter 2: Literature Review

This chapter reviews the accumulating evidence concerning health status, homelessness and drug use in the US and PR.

## 2.1. Physical and mental health status

Limited information is documented regarding the health-related quality of life among homeless. Few studies have documented the health status of homeless people using the SF-36 Health Survey. Riley and colleagues validated and tested the reliability of this questionnaire in 330 HIV-infected homeless and marginally housed adults participating in the 'Research in Access to Care in the Homeless' (REACH) Project. This cohort study collected information from 1996 to 2000. All scales reliability coefficients exceeded 0.70. The percentage of participants with the highest and lowest possible scores was generally less than 20% but compared to the general population, a higher proportion were at extremes scores. These results confirmed the study hypothesis that the SF-36 scales showed to be a valid and reliable measure for health status in this population. Another cross-sectional study evaluated the impact of depression and drug use on health status in the same population using a 36-item short form health survey (SF-36; Riley et al., 2003). They hypothesized that poorer health, as measured by the questionnaire, would be associated with lack of health insurance, homelessness and drug use. Simple and multiple regression analysis showed that depression was negatively associated with all health scales. Men reported better health status than women in the physical functioning, vitality and mental health sub-scales. Individuals with a history of drug use reported worst health. Drug use was negatively associated with the pain and energy sub-scales,

while drug treatment was negatively associated with the social functioning, role physical and mental health sub-scales. They concluded that these results reinforce the fact that associations between drug use and health status are not entirely explained by homelessness. In 2007, Tsui and colleagues evaluated the impact of hepatitis C in the health-related quality of life using the SF-36. The same sample as previously (Riley et al., 2003) was assessed. The prevalence of hepatitis C was 56%. Mean SF-36 subscale scores were consistently lower in both HIV-infected and HIV/HCV co-infected individuals compared with the U.S. population norms. Multiple linear regression showed that participants with only hepatitis C were found to have PCS scores that were, on average, lower by more than three points than their counterparts. Participants with co-infection of HIV/HCV had significantly lower SF-36 scores in the domains of physical functioning, bodily pain, social functioning, role-emotional and PCS. Hepatitis C infection was not associated with the mental health subscale, nor was it significantly associated with the MCS scale in the adjusted analysis. These results support the hypothesis that there are modest differences in the health-related quality of life among homeless and marginally housed individuals with HIV who are co-infected with hepatitis C compared to HIV alone. Another prospective cohort study evaluated homeless chronicity and health-related quality of life among adults with addictions in Boston (Kertesz et al., 2005). Two hundred and seventy-four participants of the 'Health Evaluation and Linkage to Primary Care' (HELP) trial, 17 years or older who were drug or alcohol users (alcohol, heroin or cocaine as the substance of first or second choice) were assessed for the study. Their main findings showed that at study entry, subjects had low MCS scores (unadjusted mean, 31.2±12.6), regardless of housing status, and PCS scores (unadjusted mean,

47.7±10.5) that were slightly lower than the US norm of 50. PCS did not differ by housing status. Regression analysis indicated that housing status was associated with Role-Physical ($p=0.001$), Bodily-Pain ($p=0.002$), General Health ($p=0.009$), Vitality ($p=0.01$), Social Functioning ($p<0.0001$), Role-Emotional ($p<0.0001$), and Mental Health ($p<0.0001$) subscales. The Mental Component Summary scale was associated with lifetime history of suicidal attempt/ideation, drug and alcohol consumption, number of episodic and chronic medical conditions, perceived social support from family and friends and receiving psychiatric medication. This study showed that poor mental quality of life is the norm for individuals entering a publicly funded, inner-city detoxification unit, and that the chronically homeless (22% of the sample) had markedly worst mental quality of life over two years after detoxification compared with transitionally homeless and housed subjects.

In 2000, a prospective cohort studied a community-based probability sample of 363 homeless adults from Los Angeles, US (Gelberg et al., 2000) with the intention of determining the predictors of the course of health services utilization and physical health outcomes. They proposed a major revision of the Behavioral Model (Andersen 1968, 1995), a leading model employed to explain the use of health services. Individuals were considered to be homeless if, at some point in the past 30 days, they had spent at least one night in (a) a setting that was either defined as a temporary shelter, a location not designed for shelter, or an temporary arrangement for which they did not pay; or (b) a program for homeless individuals that defined stays as temporary. Persons who were currently in their own dwelling places, but who had not been there for each of the past 30 days, were included to avoid excluding those who regularly spend the latter part of the

month on the streets or in shelters. They reported that 37.7% of people were living outdoors, 59.2% were chronic alcohol dependent and 40.1% had chronic drug dependence. Activity restriction for the past three months was reported by 34.9% of the overall sample, and 32.3% reported functional limitations. The majority did not report any restriction in activity due to a condition, but restrictions were reported with some frequency for vision impairment and skin/leg/foot problems, while 36% of the sample had a skin/leg/foot problem. More people were referred for skin/leg/foot problems than for any of the other conditions, and recreational drug use was proved to be significantly related to obtaining care for skin/leg/foot problems. Persons with a restricted activity day were significantly more likely to obtain care for their skin/leg/foot problems. The results for functional vision impairment suggest the importance of the following variables for predicting vision-related service use: older age (predisposing), not currently receiving public benefits (enabling), not having a functional limitation, worrying more about their vision, and having worse far vision at baseline (need). For skin/leg/foot problems, independent predictors of obtaining care included a longer time homeless and more commonly residing in a shelter during the previous month. Restricted activity days also predicted the use of services. The National Health Care for the Homeless Council in 2002 published a review article in an attempt to describe physical impairment and homelessness in the US. They reported that one-fifth of surveyed homeless adults residing in New York City shelters reported a disease or disability that restricted their functioning. In a national survey of homeless service users, 46% reported one or more chronic, debilitating conditions including arthritis, rheumatism, or joint problems (24%); high blood pressure (15%); and problems walking, a lost limb, or other handicap (14%).

Over two-thirds (66%) reported mental or emotional problems, alcohol use, and/or use of illegal drugs during the past month. They also indicated that the risks of developing a disability while homeless are substantial. Exposure to communicable disease in shelters, victimization, nutritional deficiencies, co-morbidities, and limited access to health care increase the likelihood that minor disabilities in homeless individuals will become serious functional impairment. People without homes are also at high risk for trauma, which may either cause or exacerbate physical disabilities. Twenty-two percent of surveyed homeless clients reported being physically assaulted while homeless. Disabled persons on crutches or in wheelchairs are especially easy targets for perpetrators. Underlying substance abuse or mental illness may increase their vulnerability to trauma and interfere with adherence to treatment of concurrent illnesses. Marrero et al. (2005) studied a sample of 124 drug injectors who received drug treatment services from November 1998 to June 2001 in PR. This longitudinal study of 557 IDUs in the north central health region aimed at understanding the factors related to drug treatment drop out among injection drug users. They reported that 26.6% dropped out of the drug treatment sessions, and gender and age were significantly associated with drug treatment drop out. IDUs who were homeless were three times (OR=3.32, p=0.03) more likely to drop out than those not reporting being homeless, and those who were primary speedball users were over three times more likely to drop out than non-speedball users (OR=3.34, p=0.01). Being homeless (adjusted OR=7.11, p=0.01) and speedball use (adjusted OR=9.00, p<0.01) were significantly associated with treatment drop out after adjusting for covariates. Participants who reported daily drug injection were nearly twice as likely to drop out as nondaily injectors (adjusted OR=2.15, p=0.06). Participants who perceived their health as

fair or poor were almost twice as likely to drop out as those who perceived their health as good or excellent (adjusted OR=1.95, p=0.09). Most importantly, individuals who score less than 50 in the SF-36, administered to assess functional status and well being, were more than twice as likely to drop out of drug treatment as those scoring more than 50 (adjusted OR=2.21, p=0.23) although this was not statistically significant. Those who scored below 33 in the self-efficacy scale were 1.5 times more likely to drop out of treatment than those who scored above 33 (adjusted OR=1.46, p=0.23), but this was not statistically significant either. Those who received two or more kinds of services for psychiatric problems significantly reduced the odds of treatment dropouts (adjusted OR=0.08, p=0.01).

### 2.2. Homelessness

Studies have documented the problem of homelessness in the US. Nyamathi and colleagues, through a cross-sectional study in 2007, recruited 664 homeless adults from Los Angeles, California. Of the overall sample, 25% revealed lifetime methamphetamine use and less than 10% of African-Americans reported ever using methamphetamine. Of those who reported current methamphetamine use, 90% shared straws to snort methamphetamine, and half used it daily. The study revealed that White ethnicity, polydrug use and binge drinking were independently associated with lifetime methamphetamine use, regardless of age. IDU was also an important correlate of methamphetamine use for older African-Americans, but not for the younger cohort. The study findings suggest that there is need for greater surveillance of methamphetamine use among White and Hispanic homeless, and methamphetamine-use prevention and

reduction targeted to younger, polydrug-using, alcohol-binging homeless adults. In a study identifying high-frequency and low-frequency health service utilization among 326 substance use adults from the Johns Hopkins Hospital in Baltimore, Maryland, 74.6% of the participants were actively using heroin (74.6%), cocaine (62.4%), and alcohol (54.4%); 94.8% had a chronic medical condition; and 53.8% reported a chronic mental health condition (O'Toole et al., 2007). This cohort study also disclosed that a high-frequency use of the emergency department services (≥ 3 visits) was independently associated with being female (adjusted OR=1.88; 95% CI: 1.12, 3.17), being African American (adjusted OR=2.36; 95% CI: 1.30, 4.29), being homeless (adjusted OR=2.07; 95% CI: 1.08, 3.96), history of more than one substance abuse treatment episode (adjusted OR=4.10; 95% CI: 3.28, 10.87), and at least one ambulatory care visit (adjusted OR=8.94; 95% CI: 3.28, 24.41). High-frequency use of ambulatory care (≥ 3 visits) was independently associated with having insurance (Medicare/Medicaid: adjusted OR=2.39; 95% CI: 1.31, 4.69), having HIV/AIDS (adjusted OR = 3.15; 95% CI: 1.70, 5.85), and receiving substance abuse treatment during the study period (adjusted OR = 3.58; 95% CI: 1.61, 7.98). They suggested that any efforts to redirect medical care to more subacute settings will likely require both capacity building and addressing a client's underlying needs, including homelessness, access to substance abuse treatment, and chronic disease management. Nyamathi (2002) described the prevalence of HCV infection in a sample of 884 homeless women and/or partners or friends from shelters and outdoor locations in Los Angeles, California, and examined risk factors for HCV infection in the overall sample and as a function of injection drug use. This cross-sectional study in 2007 revealed that 22% were found to be HCV infected. After controlling for socio-

demographic characteristics, multiple logistic regression analyses revealed that lifetime injection drug users (POR=25.78; 95% CI: 15.41, 43.10) and recent daily users of crack (POR=4.31; 95% CI: 1.03, 17.95) were more likely than nonusers or less-frequent users of these drugs to be HCV-infected. Similar results were found in the overall sample for those who had been hospitalized for a mental health problem (POR=2.08; 95% CI: 1.37, 3.16) and for drug problems (POR=2.62; 95% CI: 1.81, 3.80). It was also found that those who reported lifetime alcohol abuse were more likely than those who did not to be HCV infected. HCV infection was also associated with older age, having started living on one's own before the age of 18, and recent chronic alcohol use. Winkleby and White (1992) recruited 1,399 homeless adults who used three shelters in California during a five-month period in 1989 and 1990. A total of 45.6% of the respondents reported no impairments when they first became homeless and were likely to develop addictive and psychiatric disorders over time. Those who had been homeless at least five years reported higher rates of alcohol abuse (34.5%), illegal drug use (24.1%), and psychiatric hospitalization (20.7%). Older homeless were distinguished from those with impairments at onset of homelessness by their younger age, minority status, lower educational attainment, and lower frequency of adverse events during childhood.

Homelessness has also been documented for Puerto Rico. Reyes and colleagues in 2005 described the cross-sectional association between homelessness and HIV risk behaviors among drug injectors. The sample consisted on 557 IDUs from the North Metro Health Region of Puerto Rico (San Juan, Cataño, Bayamón, Carolina and Guaynabo) who were at least 18 years of age, drugs injectors in the last 30 days and had not been enrolled in drug treatment in the last 30 days. They reported that on-the-street

homeless were the group most likely to be HIV seropositive (27.6%) and inject drugs three or more times a day (91.2%), followed by transitionally housed (79.6%), and housed (59.5%). After adjustment for covariates, on-the-street homeless were almost three times (adjusted OR=2.54; 95% CI: 1.10, 6.16) more likely to share needles than housed IDU and over three times (adjusted OR=3.43; 95% CI: 1.32, 8.90) more likely to engage in back loading than housed IDU. Compared to transitionally housed IDUs, on-the-street homeless were 2.31 times (adjusted OR=2.31; 95% CI: 1.10, 6.33) more likely to share rinse water than housed IDU and more likely to practice injection-related HIV risk behaviors. The study suggested that drug use and HIV prevention and treatment programs need to focus interventions differently for each of these distinct drug user populations. Another study in Puerto Rico disclosed findings regarding an association between alcohol intoxication and HIV risk behaviors among injection drug users (Matos et al., 2004). This study examined injection drug users' behaviors related to HIV risk and that have not been addressed in previous epidemiological surveys and HIV prevention-intervention studies on comorbid substance use. In this intervention study, outreach workers recruited self-identified drug injectors, aged 18 years and older, from randomly selected locations, based on ethnographic mapping of neighborhood areas where drug users hang out: mainly drug markets ("copping areas"), communal drug injection sites ("shooting galleries"), and areas where sex workers await customers ("prostitution strolls"). From November 1998 to January 2001, a total of 557 drug injectors were recruited in the semi-rural municipality of Vega Baja, on the western side of the Greater San Juan Metropolitan Area. Of the overall sample, 6.1% reported being homeless. Heroin and cocaine were the most frequently used drugs, each reported by over 90% of

the sample. Marijuana and sedative use were reported by nearly one-third of participants (32% and 28%, respectively), and crack use was reported by 16%. More than half of participants (52%) reported symptoms of severe depression, and more than one-third (37%) reported severe anxiety symptoms. The prevalence of HIV seropositivity among participants at baseline was 12.6%. After adjusting for injection and sexual behaviors, participants who reported alcohol intoxication were two times (adjusted OR=2.1; 95% CI: 1.1, 4.3) more likely to share needles and cotton (adjusted OR=2.1; 95% CI: 1.1, 3.9), eight times (adjusted OR=8.0, 95% CI: 2.2, 29.2) more likely to report having sex with a paying partner, almost three times (adjusted OR=2.8, 95% CI: 1.2, 6.4) more likely to report having sex with a casual partner and six times (adjusted OR=6.0, 95% CI: 1.5, 24.5) more likely to report exchanging sex for money or drugs. Matos and colleagues concluded that among drug injectors, the association between alcohol intoxication and both injection and sexual risk behaviors was evident and of concern. Robles and colleagues in 2003 recruited a cohort of 334 drug users in PR and 617 in New York. Sampling and recruitment of participants were conducted between January 1998 and August of 1999 and 1,200 drug users completed the baseline assessment: 800 in New York City and 400 in PR. This study aimed to identify factors that account for differences in health care and drug treatment utilization patterns between Puerto Rican drug users residing in East Harlem, New York City, and Puerto Rican drug users residing in the North Metro Health Region of PR. They documented that drug users residing in PR were significantly more likely than their counterparts to be male (78.1% vs. 69.4%; p=0.002), younger (mean age, 33.5±8.3 years vs. 38.6±7.5 years; p=0.020), have a high school education (45.5% vs. 36.9%; p=0.006), used fewer non-injected drugs (mean number of

drugs, 2.0±1.6 vs. 3.0±1.9; p=0.047), more likely to inject at least three different drugs (33.2% vs. 20.9%; p<0.001) and to inject more frequently (mean number of injections, 172.0±140.1 vs. 73.6±95.2; p<0.001). Puerto Rican drug users were also less likely than New York drug participants to report use of drug treatment in the last year (55.7% vs. 79.4%; p<0.001), have health insurance (38.0% vs. 72.0%; p<0.001) and chronic health problems (24.0% vs. 49.9%; p<0.001). They were also more likely to perceive their health as fair or poor (51.5% vs. 40.2%; p<0.001). New York drugs users were significantly more likely to have used physical health services (68.4% vs. 8.7%; p<0.001) and mental health services (17.2% vs. 4.8%; p=0.001) during the last year. Participants in Puerto Rico were less likely than their counterparts in New York to have used inpatient medical services (OR=0.14; 95% CI: 0.07, 0.26), outpatient medical services (OR=0.03; 95% CI: 0.02, 0.05) or methadone (OR=0.03; 95% CI: 0.02, 0.05). After site was controlled for, health insurance and previous use of physical or mental health services remained significant predictors of health care and drug treatment utilization during the study period.

### 2.3. Drug use

Prithwish De and colleagues (2007) evaluated an approach to risk reduction for injection drug users. They included in their sample 282 IDUs from three syringe exchange programs and two methadone maintenance treatment clinics in Montreal, Canada. Their results indicated that 81% of the overall sample used cocaine and 19% used heroin as their primary injected drug. When adjusting for age and gender, cocaine injectors compared with heroin injectors were more likely to: live in unstable housing

(OR= 3.55, 95% CI: 1.49 to 8.40), self-report HCV infection (OR = 4.69, 95% CI: 2.14 to 10.31), and have a greater number of IDUs in their social network (OR = 1.61, 95% CI: 1.14 to 2.28). They were also less likely to be polydrug users (OR = 0.06, 95% CI: 0.02 to 0.16) and to have social support (OR = 0.97, 95% CI: 0.95 to 0.99). HIV and HCV infection risk seems to be linked to social network traits that are determined by drug type. Prevention efforts to control the spread of blood-borne viruses among IDUs could benefit from tailoring interventions according to the type of drug used. Another study on implicit learning, executive function and hedonic activity in chronic polydrug abusers (Steven et al., 2007) used a sample of 25 male polydrug users recruited from a community treatment center and from drug counseling services in Germany. Among chronic polydrug abusers, there were moderate impairments of implicit learning, of acquisition, reversal and extinction of conditioned responses, of latent inhibition as well as anhedonia, while working memory was spared compared with the control group. The findings of the study also suggested that current polydrug abusers suffer from impairment of many cognitive functions and from anhedonia. Anhedonia was correlated with implicit learning but not with executive function and was still present during abstinence. Another study (Usdan et al., 2001) included 141 homeless persons with substance use and other non-psychotic mental disorders seeking drug treatment at a metropolitan health care agency for homeless persons in Alabama, US. The study had the intention to examine the co-occurrence of cocaine, alcohol, marijuana, and other drug use among treatment seeking homeless persons to determine whether alcohol use predicted cocaine use differently than marijuana and other drugs predicted cocaine use. Subjects had to meet criteria for (*a*) homelessness according to the 1985 McKinney Act (17); (*b*) self-reported

crack cocaine use within the last 2 weeks; and (*c*) psychological distress. Among the sample, psychoactive substance use disorders were diagnosed in the following proportions: 57.8% alcohol, 96.9% cocaine, 18.0% marijuana, and 10.9% other drug disorders. Additionally, 60.2% had two or more psychoactive substance use disorders, and 39.8% had only one. Of the 124 participants, 56.5% were positive for alcohol and cocaine, whereas 43.5% were positive for cocaine only. Alcohol use was significantly greater among persons who were cocaine positive than those who were cocaine negative at all times ($p<0.01$). The study results supported the assertion that cocaine use was strongly associated with extent of alcohol use and that the association between cocaine and alcohol was stronger than the association between cocaine and marijuana or other drug use. Williamson and colleagues (2006) studied a cohort of 495 heroin users seeking drug treatment in a 12-month follow up study in Australia, with the purpose of determining the effects of cocaine use across the study period on outcomes of treatment for heroin dependence 12 months post-treatment entry. In the report, cocaine was widely used among treatment entrants with almost all having a lifetime history of cocaine use and almost half having used in the month preceding baseline. There was an overall decline in cocaine use across the study period, and approximately half of the cohort did not report cocaine use at any data point, with the remainder reporting having used at one (29%), two (12%), or at all three (5%) points of the interview process. Cocaine use across the study period was an independent predictor of most major treatment outcomes, with more cocaine use points predicting poorer outcomes. Persistent cocaine use predicted a higher prevalence of homelessness, heroin use, daily injecting, needle sharing and injection-related health problems at 12 months as well as more extensive recent polydrug

use. The study concluded that cocaine use was common among individuals seeking treatment for primary heroin dependence. Any cocaine use over the study period was associated with poorer outcomes in virtually all areas. They suggested that individuals seeking heroin drug treatment services with use of cocaine must be a concern among services providers and should be specifically target during the rehabilitation process. In 1997, Griffits and Weerts reviewed all the literature regarding benzodiazepine use and the implications of the long-term use and abuse. Long-term complications included memory impairment, risk of accidents, falls and hip fractures in the elderly, withdrawal syndrome, brain damage, overuse in the elderly, overuse by chronic pain patients, overuse by alcoholics and recreational abuse among alcoholics and polydrug abusers. This meta-analysis found that recreational abuse of benzodiazepines is increased in subjects with a history of sedative drug self-administration. The article also reported that benzodiazepines function as reinforcers in subjects with anxiety, insomnia, and histories of moderate alcohol consumption, and in preclinical studies showing stable, low-rate benzodiazepine self-injection with concurrent physical dependence under conditions of continuous availability.

Polydrug use has been documented as an issue of concern among drug users in PR. An exploratory qualitative study assessed 25 participants who were recruited between February 2003 and June 2004 from two large drug-copping areas located in the municipality of Bayamón, PR (Finlinson et al., 2006). Participants were individuals aged 18 to 35 years old, drug injectors for 1.5 years or less, residents in the municipality of Bayamón, and self-identificated as Puerto Ricans. In the sample studied, 21% reported being homeless. In 10% of participants their first drug used was marijuana at a mean age

of 14.2 years old (range 10-19), 14% used crack cocaine or smoked cocaine (crushed crack or white powder) for the first time through the use of mixed marijuana, 4% used heroin and cocaine respectively for the first time by injecting it, and 8% used heroin for the first time through the use of marijuana. Routes of drug administration were an important issue in the study as 88% used cocaine for the first time at the mean age of 17 years old (range 14-22), and 82% first ingested it by snorting it. Eighty-eight percent of the participants first used heroin at an average age of 18.4 years old and ingested it by snorting it for the first time. The drug use histories of the study revealed that, at any given period, study participants had a primary drug of use, drugs that enhanced the positive effects or attenuated the negative effects of the primary drug, and other drugs that were not used interactively with the primary drug. A study done by Colón and colleagues in 2001 identified factors that accounted for differences in the injection frequency of drug users from Bayamón, Puerto Rico and East Harlem, New York. They examined the use of injected and non-injected drugs and their influence on the between-city variation in injection frequency and the amounts of drug solution injected and whether the amounts affected the injection frequencies. Sampling and recruitment of participants were conducted between January 1998 and August of 1999, and 1,200 drug users completed the baseline assessment: 800 in New York City and 400 in PR. To be eligible, study subjects had to self-define as being of Puerto Rican ethnicity, had to have injected drugs or smoked crack cocaine during the last 30 days, be at least 8 years old, and have not been in an in-patient drug treatment program in the previous 30 days. Homeless was operationally defined as living in the street or in a shelter. The mean frequency of injection among Puerto Rican IDUs in East Harlem was 2.8±2.7, whereas the

corresponding mean in Bayamón was almost twice as high, 5.4±4.0 ($p<0.001$). A higher proportion of study participants in East Harlem reported homelessness than in Bayamón (34.1% and 23.2% respectively, $p=0.001$). Nearly a third of the IDUs recruited in East Harlem had initiated drug injection in Puerto Rico, but only 10% of the IDUs in Bayamón had initiated drug injection in New York City or in another U.S. city ($p<0.001$). Drug users in Bayamón were also significantly less likely (10.4% and 54.4%; $p<0.001$) to be taking prescribed methadone than IDUs in East Harlem and non-prescribed methadone (3.7% and 21.3%; $p<0.001$). IDUs in Bayamón were more likely to report injection of cocaine alone (66.6% and 46.3%; $p<0.001$) and heroin and cocaine together (91.1% and 53.9%; $p<0.001$). The maximum amount of drug solution injected also differed in the two groups of IDUs, being higher in Bayamón. Younger IDUs injected more frequently than their older counterparts and even after controlling for drug use related factors, the only demographic/psychosocial factor that remained significantly associated with frequency of injection was age. Homelessness was also found to significantly increase the expected frequency of injection by 14% ($p=0.019$). Injection of cocaine alone and injection of speedball were both found to increase the expected frequency of injection by about 30% ($p<0.001$ in both cases).

**Table 2.1: Synthesis of literature review – Physical and mental health status**

| Author & Year | Study Design | Study Sample | Main Findings |
|---|---|---|---|
| Tsui et al., 2007 | Cross-sectional study | 216 HIV-infected homeless and marginally housed adults participating in the REACH project (same sample as Riley et al., 2003) | • Median age: 41<br>• 83% were males<br>• Prevalence of HCV: 56%<br>*Bivariate Analysis*<br>• There were no significant differences between patients with HIV alone and co-infected with HIV/HCV.<br>• Unadjusted differences demonstrated that patients with HCV were more likely to be currently using injection drugs and crack cocaine ($p < 0.05$)<br>• Mean SF-36 subscale scores were consistently lower in both HIV-infected and HIV/HCV co-infected individuals compared with the U.S. population norms.<br>• Scores were lower in all domains for individuals co-infected with HIV/HCV compared with HIV alone, although the effect was statistically significant only for physical functioning, social function, role limitation-emotional, and bodily pain.<br>*Multiple Linear Regression*<br>• Participants with only HCV were found to have:<br>- PCS that were on average more than three points lower than participants who did not have HCV (adjusted final model $\beta$=-0.73, 95% CI: –6.45 to –1.01).<br>- There was not an effect of HCV infection on the mental health subscale, nor was HCV significantly associated with the MCS in the unadjusted or adjusted analysis.<br>• Being female, having additional medical co-morbidities and a higher HIV viral load were highly associated with lower PCS.<br>• Participants with co-infection of HIV/HCV:<br>- had significantly lower mean SF-36 scores in the domains of physical functioning, bodily pain, social functioning and role emotional.<br>- had a mean PCS score more than three points lower.<br>• These results support the hypothesis that there are modest differences in HRQOL among homeless and marginally housed individuals with HIV who are co-infected with HCV compared to HIV alone. |

**Table 2.1: Synthesis of literature review – Physical and mental health status (continuation)**

| Author & Year | Study Design | Study Sample | Main Findings |
|---|---|---|---|
| Kertesz et al., 2005 | Prospective cohort study | 274 participants of the 'Health Evaluation and Linkage to Primary Care' trial (HELP), aged 17 years or older and drug or alcohol users (alcohol, heroin or cocaine as the substance of first or second choice) | • 22% were chronically homeless<br>• 39% were housed<br>• 39% were transitionally homeless<br>• Median number of nights in the streets in the previous 6 months: 24<br>• Chronically homeless were:<br>- older<br>- less likely to be Black<br>- less likely to be married<br>- with greater numbers of acute and chronic medical conditions<br>- more likely to report alcohol as substance of choice<br>- greater psychiatric morbidity<br>- more likely to obtain poorer scores than the other groups over time<br>• At study entry, subjects had low MCS scores (unadjusted mean 31.2±12.6), regardless of housing status, and PCS scores (unadjusted mean 47.7±10.5) that were slightly lower than the US norm of 50.<br>• The core longitudinal regression model showed that housing status was significantly associated with Role Physical (p=0.001), Bodily Pain (p=0.002), General Health (p=0.009), Vitality (p=0.01), Social Functioning (p<0.0001), Role Emotional (p<0.0001), and Mental Health (p<0.0001) subscales.<br>• Variables associated with MCS were:<br>- receipt of psychiatric medication<br>- lifetime history of suicidal attempt/ ideation<br>- Addiction and alcohol severity indexes<br>- numbers of episodic and chronic medical conditions<br>- perceived social support from family and friends<br>• The study showed that poor mental HRQOL is the norm for individuals entering a publicly funded, inner-city detoxification unit, and that the chronically homeless had markedly worse mental HRQOL over 2 years after detoxification compared with transitionally homeless and housed subjects.<br>• Physical HRQOL did not differ by housing status. |

**Table 2.1: Synthesis of literature review – Physical and mental health status (continuation)**

| Author & Year | Study Design | Study Sample | Main Findings |
|---|---|---|---|
| Riley et al., 2003 | Cohort study | 330 HIV-infected homeless and marginally housed adults participating in the REACH project were interviewed from 1995 to 2000. | • Median age: 39<br>• 68% graduated from high school<br>• 33% were current injection drug users<br>• 23.8% were currently homeless and sheltered individuals<br>• All reliability coefficients exceeded 0.70 (range: 0.77–0.90) and all reliability coefficients exceeded inter-scale correlations for the same scale<br>• The percentage of respondents at the highest possible score (ceiling) and lowest (floor) was generally less than 20%. Exceptions occurred in the case where only two items comprised a scale (i.e., Social Functioning and Bodily Pain), as well as in the case where the response was dichotomous (i.e., Role Physical and Role Emotional). Compared to the general US population, a higher proportion of REACH participants were generally at the floor and a lower proportion were at the ceiling.<br>• All scales were significantly associated with depression in linear regression models.<br>• Depression predicted both the Mental Health composite score ($p<0.001$, $\beta=-13.8$) and the physical health composite score ($p=0.001$, $\beta=-5.9$) in linear regression models.<br>• REACH staff interviewers offered anecdotal information regarding interviews that contained the SF-36. Administration of the SF-36 was possible, and respondents appeared able to understand SF-36 questions. However, respondents complained of seemingly redundant questions and the length they added to the study questionnaire. In addition, interviewers cited golf and bowling as inappropriate examples within questions assessing physical functioning for the current population. |

**Table 2.1: Synthesis of literature review – Physical and mental health status (continuation)**

| Author & Year | Study Design | Study Sample | Main Findings |
|---|---|---|---|
| Riley et al., 2003 | Cross-sectional study | 330 HIV-infected homeless and marginally housed adults participating in the REACH project in California | • Median age: 39<br>• 85% were males<br>• 68% graduated from high school<br>• 33% were current injection drug users<br>• 23.8% were currently homeless and sheltered individuals<br>• Depression was negatively associated with all health scales in both bivariate and multivariable models<br>• While medical care variables (inpatient and emergency department visits) were significantly associated with most scales in bivariate analyses, these variables generally dropped out of the multivariable models<br>• History of injection drug use dropped out of multivariable models for general health and social functioning when depression was added.<br>• Even after adjusting for depression, recent drug treatment was associated with lower social functioning and role-emotional scores.<br>• Recruitment wave, ethnicity, and current housing status were not significantly associated with health measurements in this study.<br>• Men reported better health than women with respect to physical functioning, vitality, and overall mental health subscales.<br>• Individuals with a history of drug use reported worse health.<br>• Health insurance was only associated with physical functioning in this population.<br>• Drug use was negatively associated with pain and energy subscales, while drug treatment was negatively associated with social functioning, role physical and mental health subscales. These results reinforce the fact that associations between drug use and health status are not entirely explained by homelessness. |

**Table 2.1: Synthesis of literature review – Physical and mental health status (continuation)**

| Author & Year | Study Design | Study Sample | Main Findings |
|---|---|---|---|
| Gelberg et al., 2000 | Prospective cohort study | • Community-based probability sample of 363 homeless adults from Los Angeles, CA. This UCLA Homeless Health Study sample is a subset of the sample from the RAND Course of Homelessness Study.<br><br>• Individuals were considered to be homeless if, at some point in the past 30 days, they had spent at least one night in (a) a setting that was either defined as a temporary shelter, a location not designed for shelter, or an impermanent arrangement for which they did not pay; or (b) a program for homeless individuals that defined stays as temporary. Persons who were currently in their own dwelling places, but who had not been there for each of the past 30 days, were included to avoid excluding those who regularly spend the latter part of the month on the streets or in shelters. | • Living outdoors as a current type of residence: 37.7%<br>• Chronic alcohol dependence: 59.2%<br>• Chronic drug dependence: 40.1%<br>• Heavy alcohol use in the past 30 days: 29.1%<br>• Drug use in the past 30 days: 27.2%<br>• Restricted activity during the past 3 months: 34.9%<br>• Functional limitations: 32.3%<br>• The majority did not report any restriction in activity due to a condition, but restrictions were reported with some frequency for vision impairment and skin/leg/foot problems.<br>• 36% had a skin/leg/foot problem<br>• More people were referred for skin/leg/foot problems (39.1%) than for any of the other conditions.<br>• Recreational drug use was proved to be significantly related to obtaining care for skin/leg/foot problems.<br>• Persons with a restricted activity day were significantly more likely to obtain care for their skin/leg/foot problems.<br>• The results for functional vision impairment suggest the importance of the following variables for predicting vision-related service use: older age (predisposing), not currently receiving public benefits (enabling), not having a functional limitation, worrying more about their vision, and having worse far vision at baseline (need).<br>• For skin/leg/foot problems, independent predictors of obtaining care included a longer time homeless and more commonly residing in a shelter during the previous month.<br>• Restricted activity days also predicted the use of services. |

**Table 2.1: Synthesis of literature review – Physical and mental health status (continuation)**

| Author & Year | Study Design | Study Sample | Main Findings |
|---|---|---|---|
| National Health Care for the Homeless Council, 2002 | Review article | | • One-fifth of surveyed homeless adults residing in New York City shelters reported a disease or disability that restricted their functioning (Barrow et al., 1999). In a national survey of homeless service users, 46% reported one or more chronic, debilitating conditions including arthritis, rheumatism, or joint problems (24%); high blood pressure (15%); and problems walking, a lost limb, or other handicap (14%). Over two-thirds (66%) reported mental or emotional problems, alcohol use, and/or use of illegal drugs during the past month.<br>• Risks of developing a disability while homeless are substantial. Exposure to the elements or to communicable disease in shelters, victimization, nutritional deficiencies, co-morbidities, and limited access to health care increase the likelihood that minor disabilities in homeless individuals will become serious functional impairments.<br>• People without homes are also at high risk for trauma, which may either cause or exacerbate physical disabilities. Twenty-two percent of surveyed homeless clients report being physically assaulted while homeless. Disabled persons on crutches or in wheelchairs are especially easy targets for perpetrators. Underlying substance abuse or mental illness may increase their vulnerability to trauma and interfere with adherence to treatment of concurrent illnesses. |

**Table 2.1: Synthesis of literature review – Physical and mental health status (continuation)**

| Author & Year | Study Design | Study Sample | Main Findings |
|---|---|---|---|
| Marrero et al., 2005 | Prospective cohort study | 124 drug injectors who reported having received drug treatment services other than in prison, were studied from November 1998 to June 2001. This sample is part of a 557 IDUs longitudinal study. Recruited in the north central health region of Puerto Rico. | • 26.6% dropped out of the drug treatment sessions<br>• Gender and age were significantly associated with drug treatment drop out.<br>• Homeless were three times (OR=3.32, p=0.03) more likely to drop out than those not reporting being homeless.<br>• Those who were primary speedball users were over three times more likely to drop out than non-speedball users (OR=3.34, p=0.01).<br>• After adjustment, participants who reported being homeless were seven times more likely (adjusted OR=7.11, p=0.01), and speedball users were nine times more likely (adjusted OR=9.00, p<0.01), to drop out of treatment.<br>• Participants who reported daily drug injection were nearly twice as likely to drop out as nondaily injectors (adjusted OR=2.15, p=0.06)<br>• Participants who perceived their health as fair or poor were almost twice as like likely to drop out as those who perceived their health as good or excellent (adjusted OR=1.95, p=0.09).<br>• Individuals who score less than 50 on the MOS 36-Item Short-Form Health Survey (SF-36) administered to assess functional status and well being were more than twice as likely to drop out of drug treatment as those scoring more than 50 (adjusted OR=2.21, p=0.23).<br>• Those individuals who score below 33 in the self-efficacy scale were 1.5 time more likely to drop out of treatment than those who scored above 33 (adjusted OR=1.46, p=0.23).<br>• Those receiving two or more kinds of services for psychiatric problems significantly reduced the odds of treatment drop outs (adjusted OR=0.08, p=0.01). |

**Table 2.2: Synthesis of literature review – Homelessness**

| Author & Year | Study Design | Study Sample | Main Findings |
|---|---|---|---|
| Nyamathi et al., 2007 | Cross-sectional study | 664 homeless adults from Los Angeles, California. | • 25% of the overall sample revealed lifetime methamphetamine use.<br>• Less than 10% of African-Americans reported ever using methamphetamine.<br>• Of those who reported current methamphetamine use, 90% shared straws to snort methamphetamine and half used it daily.<br>• Logistic regression analysis in younger (18-39 years) and older (40+ years) respondents revealed that White ethnicity, polydrug use and binge drinking were independently associated with lifetime methamphetamine use, regardless of age.<br>• IDU was also an important correlate of methamphetamine use for older African-Americans, but not for the younger cohort.<br>• Findings suggest that there is need for greater surveillance of methamphetamine use among homeless whites and Hispanics, and methamphetamine-use prevention and reduction targeted to younger, polydrug-using, alcohol-binging homeless adults. |

**Table 2.2: Synthesis of literature review – Homelessness (continuation)**

| Author & Year | Study Design | Study Sample | Main Findings |
|---|---|---|---|
| O'Toole et al., 2007 | Retrospective / Prospective Cohort study | 326 substance use adults from the Johns Hopkins Hospital in Baltimore, MD | • 74.6% of the participants were actively using heroin (74.6%), cocaine (62.4%), and alcohol (54.4%); 94.8% had a chronic medical condition; and 53.8% reported a chronic mental health condition.<br>• High-frequency use of the emergency department services (≥ 3 visits) was independently associated with being female (adjusted OR= 1.88; 95% CI: 1.12, 3.17), being African American (adjusted OR = 2.36; 95% CI: 1.30, 4.29), being homeless (adjusted OR = 2.07; 95% CI: 1.08, 3.96), a history of > 1 substance abuse treatment episode (adjusted OR = 4.10; 95% CI: 3.28, 10.87), and ≥ 1 ambulatory care visit (adjusted OR = 8.94; 95% CI: 3.28, 24.41).<br>• The combination of having certain chronic conditions (seizure disorder, hepatitis B, and hepatitis C) and accessing ambulatory care was protective against high-frequency use of the services.<br>• In contrast, high-frequency use of ambulatory care (≥3 visits) was independently associated with having insurance (Medicare/Medicaid: adjusted OR = 2.39; 95% CI: 1.31, 4.69), having HIV/AIDS (adjusted OR = 3.15; 95% CI: 1.70, 5.85), and receiving substance abuse treatment during the study period (adjusted OR = 3.58; 95% CI: 1.61, 7.98).<br>• Efforts to redirect medical care to more subacute settings will likely require both capacity building and addressing a client's underlying needs, including homelessness, access to substance abuse treatment, and chronic disease management. |

**Table 2.2: Synthesis of literature review – Homelessness (continuation)**

| Author & Year | Study Design | Study Sample | Main Findings |
|---|---|---|---|
| Nyamathi et al., 2002 | Cross-sectional study | 884 homeless women and/or partners or friends from shelters and outdoor locations in Los Angeles, California. | • Among this sample of 884 homeless and impoverished adults, 22% were found to be HCV infected.<br>• After controlling for socio-demographic characteristics, multiple logistic regression analyses revealed that lifetime injection drug users (POR=25.78; 95% CI: 15.41, 43.10) and recent daily users of crack (POR= 4.31; 95% CI: 1.03, 17.95) were more likely than nonusers or less-frequent users of these drugs to be HCV-infected.<br>• Similar results were found for those who had been hospitalized for a mental health problem (POR= 1.08; 95% CI: 1.37, 3.16) and for drug problems (POR= 2.62; 95% CI: 1.81, 3.80).<br>• Among non-injection drug users and persons in the total sample, those who reported lifetime alcohol abuse were more likely than those who did not to be HCV infected.<br>• HCV infection was also predicted by older age, having started living on one's own before the age of 18, and recent chronic alcohol use.<br>• Males and recent crack users had about one and a half times greater odds of HCV infection when compared to females and non-chronic crack users. |
| Winkleby & White, 1992 | Cross-sectional study | 1,399 homeless adults who used three shelters in California, US, during a five-month winter period in 1989 and 1990. | • A total of 45.6% of the respondents reported no impairments when they first became homeless and were likely to develop addictive and psychiatric disorders over time.<br>• Those who had been homeless five years or more reported high rates of alcohol abuse (34.5%), illegal drug use (24.1%), and psychiatric hospitalization (20.7%).<br>• Older homeless were distinguished from those with impairments at onset of homelessness by their younger age, minority status, lower educational attainment, and lower frequency of adverse events in childhood. |

**Table 2.2: Synthesis of literature review – Homelessness (continuation)**

| Author & year | Study Design | Study Sample | Main Findings |
|---|---|---|---|
| Reyes et al., 2005 | Cross-sectional study | 557 IDUs, at least 18 years of age, who had injected drugs in the last 30 days and had not been enrolled in drug treatment in the last 30 days recruited from the North Metro Health Region (San Juan, Cataño, Bayamón, Carolina and Guaynabo), Puerto Rico. | • On-the-street homeless was the group most likely to:<br>- inject drugs three or more times a day (91.2%), followed by transitionally housed (79.6%), and housed (59.5%)<br>- be HIV seropositive than transitionally housed and housed IDUs.<br>- be almost three times more likely to share needles than housed IDU (adjusted OR = 2.54; 95% CI: 1.10, 6.16)<br>- over three times more likely to engage in back loading than housed IDUs (adjusted OR = 3.42; 95% CI: 1.32, 8.90).<br>-share rinse water than housed IDUs (adjusted OR=2.31; 95% CI: 1.10, 6.33).<br>• On-the-street homeless IDUs were found to be more likely to practice injection-related HIV risk behaviors than transitionally housed IDUs.<br>• The results suggest that drug use and HIV prevention and treatment program need to focus interventions differently for each of these distinct drug user populations. |

**Table 2.2: Synthesis of literature review – Homelessness (continuation)**

| Author & Year | Study Design | Study Sample | Main Findings |
|---|---|---|---|
| Matos et al., 2004 | Longitudinal prevention-intervention study | Outreach workers recruited self-identified drug injectors, age 18 years and older, from randomly selected locations, based on ethnographic mapping of neighborhood areas where drug users hang out: mainly drug markets ("copping areas"), communal drug injection sites ("shooting galleries"), and areas where sex workers await customers ("prostitution strolls"). From November 1998 to January 2001, a total of 557 drug injectors were recruited in the semi-rural municipality of Vega Baja, on the western side of the Greater San Juan Metropolitan Area. | • 6% of the sample reported being homeless.<br>• Heroin and cocaine were the most frequently used drugs, each reported by over 90% of the sample. Marijuana and sedative use were reported by close to one-third of participants (32% and 28%, respectively), and crack use was reported by 16%.<br>• More than half of participants (52%) reported symptoms of severe depression, and more than one-third (37%) reported severe anxiety symptoms.<br>• The prevalence of HIV seropositivity among participants tested at baseline was 12.6%.<br>• Results of multiple logistic regressions of alcohol intoxication against injection and sexual behaviors indicated that after adjustment, participants who reported alcohol intoxication were:<br>- two times more likely to share needles (adjusted OR = 2.1; 95% CI: 1.1, 4.3) and cotton (adjusted OR = 2.1; 95% CI: 1.1, 3.9).<br>- eight times more likely to report having sex with a paying partner (adjusted OR = 8.0; 95% CI: 2.2, 29.2)<br>- almost three times more likely to report having sex with a casual partner (adjusted OR = 2.8; 95% CI: 1.2, 6.4).<br>- six times more likely to report exchanging sex for money or drugs (adjusted OR = 6.0; 95% CI: 1.5, 24.5).<br>• Among drug injectors, the association between alcohol intoxication and both injection and sexual risk behaviors is straightforward. |

**Table 2.2: Synthesis of literature review – Homelessness (continuation)**

| Author & Year | Study Design | Study Sample | Main Findings |
|---|---|---|---|
| Robles et al., 2003 | Cohort study | 334 drug users in PR and 617 in NY. Sampling and recruitment of participants were conducted between January 1998 and August of 1999 and 1,200 drug users completed the baseline assessment: 800 in New York City and 400 in Puerto Rico. To be eligible, study subjects had to self-define as being of Puerto Rican ethnicity, had to have injected drugs or smoked crack cocaine during the last 30 days, be 18 years old or more, and have not been in an in-patient drug treatment program in the previous 30 days. Homeless was operationally defined as living in the street or in a shelter. | • Puerto Rican drug users (those residing in Puerto Rico) were significantly more likely as compared to drug users in New York to be:<br>- male (78.1% vs. 69.4%; p=0.002)<br>- younger (mean age, 33.5±8.3 years vs. 38.6±7.5 years; p=0.020)<br>- have a high school education (45.5% vs. 36.9%; p=0.006)<br>- less likely to live with a sex partner (15.9% vs. 28.4% ; p< 0.006)<br>- used fewer non-injected drugs (mean number of drugs, 2.0±1.6 vs. 3.0±1.9; p=0.047)<br>- more likely to inject ≥ 3 different drugs (33.2% vs. 20.9%; p<0.001 and to inject more frequently (mean number of injections in the last 30 days, 172.0±140.1 vs. 73.6±95.2; p<0.001)<br>- less likely than New York drug participants to report use of drug treatment in the last year (55.7% vs. 79.4%; p<0.001)<br>- less likely to report having health insurance (38.0% vs. 72.0%; p<0.001)<br>- less likely to have chronic health problems (24.0% vs. 49.9%; p<0.001), and having a diagnosis of HIV/AIDS (13.2% vs. 17.5%; p=0.05), tuberculosis (1.8% vs. 12.5%; p<0.001), or a STD (13.8% vs. 29.5%; p<0.001)<br>- more likely to perceive their health as fair or poor (51.5% vs. 40.2%; p<0.001)<br>• New York users were significantly more likely to have used physical health services (68.4% vs. 8.7%; p<0.001) and mental health services (17.2% vs. 4.8%; p<0.001) during the last year, before the baseline interview.<br>• Those in Puerto Rico were less likely than their counterparts in New York to have used inpatient medical services (OR=0.14; 95% CI: 0.07, 0.26), outpatient medical services (OR=0.03; 95% CI: 0.02, 0.05) or methadone (OR=0.03; 95% CI: 0.02, 0.05). After site was controlled for, health insurance and previous use of physical or mental health services remained significant predictors of health care and drug treatment utilization during the study period. |

**Table 2.3: Synthesis of literature review – Drug use**

| Author & Year | Study Design | Study Sample | Main Findings |
|---|---|---|---|
| De P et al., 2007 | Cross-sectional study | 282 IDUs from three syringe exchange programs and two methadone maintenance treatment clinics in Montreal, Canada. | • 81% of the overall sample used cocaine, and 19% used heroin as their primary injected drug.<br>• Adjusting for age and gender, cocaine injectors compared with heroin injectors were more likely to:<br>- live in unstable housing (OR= 3.55; 95% CI: 1.49, 8.40)<br>- self-report HCV infection (OR=4.69; 95% CI: 2.14, 10.31), and have a greater number of IDUs in their social network (OR = 1.61; 95% CI: 1.14, 2.28)<br>- were less likely to be polydrug users (OR=0.06; 95% CI: 0.02, 0.16) and to have social support (OR = 0.97; 95% CI: 0.95, 0.99).<br>• The injecting networks of cocaine users were more likely to have members who were older (OR = 1.08; 95% CI: 1.04, 1.12), had a history of shooting gallery use (OR = 2.27; 95% CI: 1.08, 4.76), and had shorter relationships with the subject (OR = 0.91; 95% CI: 0.85, 0.97).<br>• HIV and HCV infection risk seems to be linked to social network traits that are determined by drug type. Prevention efforts to control the spread of blood borne viruses among IDUs could benefit from tailoring interventions according to the type of drug used. |
| Stevens et al., 2007 | Cross-sectional study | 25 male polydrug users recruited from a community treatment center and from drug counseling services in Germany. | • In chronic polydrug abusers, there were moderate impairments of implicit learning, of acquisition, reversal and extinction of conditioned responses, of latent inhibition as well as anhedonia, while working memory was spared compared with the control group.<br>• The findings of this study suggested that current polydrug abusers suffer from impairment of many cognitive functions and from anhedonia. During abstinence, there is near normal cognitive function but still anhedonia. Anhedonia was correlated with implicit learning but not with executive function. |

**Table 2.3: Synthesis of literature review –Drug use (continuation)**

| Author & year | Study Design | Study Sample | Main Findings |
|---|---|---|---|
| Usdan et al., 2001 | Randomized controlled clinical trial | 141 homeless persons with substance use and other nonpsychotic mental disorders seeking drug treatment at a metropolitan health care agency for homeless persons in Alabama, US. Subjects had to meet criteria for (*a*) homelessness according to the 1985 McKinney Act (17); (*b*) self-reported crack cocaine use within the last 2 weeks; and (*c*) psychological distress. | • Among the sample, psychoactive substance use disorders were diagnosed in the following proportions: 57.8% alcohol, 96.9% cocaine, 18.0% marijuana, and 10.9% other drug disorders. In addition, 60.2% had two or more psychoactive substance use disorders, and 39.8% had only one.<br>• Of the 124 participants, 56.5% were positive for alcohol and cocaine, whereas 43.5% were positive for cocaine only.<br>• Alcohol use was significantly greater among persons who were cocaine positive than those who were cocaine negative at all times ($p<0.01$).<br>• Results supported the assertion that cocaine use was strongly associated with extent of alcohol use and that the association between cocaine and alcohol was stronger than the association between cocaine and marijuana or other drug use. |
| Williamson et al., 2006 | Prospective cohort study | 495 heroin users seeking drug treatment were assessed in a 12-month follow-up study in Australia, with the purpose of determining the effects of cocaine use across the study period on outcomes of treatment for heroin dependence 12 months post-treatment entry. | • Cocaine was widely used among treatment entrants with almost all having a lifetime history of cocaine use and almost half having used in the month preceding baseline.<br>• There was an overall decline in cocaine use across the study period.<br>• Approximately half of the cohort did not report cocaine use at any data point, with the remainder reporting having used at one (29%), two (12%), or at all three (5%) points.<br>• Cocaine use across the study period was an independent predictor of most major treatment outcomes, with more cocaine use points predicting poorer outcome.<br>• Persistent cocaine use predicted a higher prevalence of homelessness, heroin use, daily injecting, needle sharing and injection-related health problems at 12 months as well as more extensive recent polydrug use.<br>• The study concluded that cocaine use was common among individuals seeking treatment for primary heroin dependence. Any cocaine use over the study period was associated with poorer outcomes in virtually all areas.<br>• Although the use of cocaine over the study period was detrimental, its use among clients should evidently be a cause for concern amongst treatment providers and may warrant being specifically targeted during treatment. |

**Table 2.3: Synthesis of literature review – Drug use (continuation)**

| Author & Year | Study Design | Study Sample | Main Findings |
|---|---|---|---|
| Griffiths & Weerts, 1997 | Meta-analysis | | • The article reviews the problem that has been identified with the long-term use and the recreational abuse of benzodiazepines, including memory impairment, risk of accidents, falls and hip fractures in the elderly, a withdrawal syndrome, brain damage, overuse in the elderly, overuse by chronic pain patients, overuse by alcoholics and recreational abuse among alcoholics and polydrug abusers.<br>• Recreational abuse of benzodiazepines has been modeled in human research with polydrug abusers and in laboratory animal studies, which show that the reinforcing effect of benzodiazepines is intermediate relative to other sedative compounds and is increased in subjects with histories of previous sedative drug self-administration.<br>• The article also reported that benzodiazepines function as reinforcers in subjects with anxiety, insomnia, and histories of moderate alcohol consumption, and in preclinical studies showing stable, low-rate benzodiazepine self-injection with concurrent physical dependence under conditions of continuous availability. |

**Table 2.3: Synthesis of literature review – Drug use (continuation)**

| Author & Year | Study Design | Study Sample | Main Findings |
|---|---|---|---|
| Finlinson et al., 2006 | Exploratory qualitative study | 25 participants of the study represented a convenience sample recruited between February 2003 and June 2004 from two large drug-copping areas located in the municipality of Bayamón, Puerto Rico. They were individuals aged 18 to 35 years old, drug injecting for a total elapsed time of 1.5 years or less, living in the municipality of Bayamón, and self-identified as Puerto Ricans. | • 21% reported being homeless.<br>• 10% of all participants reported that their first drug used was marijuana at a mean age of 14.2 years old.<br>• 14% used crack cocaine or smoked cocaine (crushed crack or white powder) for the first time trough the use of mixed marijuana.<br>• 4% used heroin and cocaine, respectively, for the first time by injecting it.<br>• 8% used heroin for the first time through the use of marijuana<br>• 88% used cocaine for the first time at the mean age of 17 years old, and 82% first ingested it by snorting it.<br>• 88% of the participants first used heroin at an average age of 18.4 years old and ingested it by snorting it for the first time.<br>• Their drug use histories revealed that, at any given period, study participants had a primary drug of use, drugs that enhanced the positive effects or attenuated the negative effects of the primary drug, and other drugs that were not used interactively with the primary drug. Primary drugs typically changed from marijuana to heroin or from marijuana to cocaine and then to heroin.<br>• Certain drugs used to enhance or attenuate drug effects at one point in time (e.g., cocaine ameliorating marijuana, heroin ameliorating crack) became primary drugs of use, whereas certain primary drugs of use (e.g., marijuana) were used at a later period to enhance/attenuate effects related to a different primary drug (e.g., heroin). The use of drugs to enhance/attenuate during a specific period of time appeared intimately connected to changes in primary drugs. |

**Table 2.3: Synthesis of literature review – Drug use (continuation)**

| Author & Year | Study Design | Study Sample | Main Findings |
|---|---|---|---|
| Colón et al., 2001 | Cross-sectional study | Sampling and recruitment of participants were conducted between January 1998 and August of 1999, and 1,200 drug users completed the baseline assessment: 800 in East Harlen, NY and 400 in Bayamón, PR. To be eligible, study subjects had to self-define as being of Puerto Rican ethnicity, had to have injected drugs or smoked crack cocaine during the last 30 days, be 18 years old or more, and have not been in an in-patient drug treatment program in the previous 30 days. Homeless was operationally defined as living in the street or in a shelter. | • The mean frequency of injection among Puerto Rican IDUs in East Harlem was 2.8; the corresponding mean in Bayamón was almost twice as high, 5.4 ($p<0.001$).<br>• A higher proportion of study participants in East Harlem reported homelessness than in Bayamón (34.1% in East Harlem vs. 23.2% in Bayamón, $p= 0.001$).<br>• Nearly a third of the IDUs recruited in East Harlem had initiated drug injection in Puerto Rico, but only 10% of the IDUs in Bayamón had initiated drug injection in New York City or in another U.S. city ($p<0.001$).<br>• IDUs in Bayamón were also significantly less likely to be currently taking either prescribed or non-prescribed methadone than IDUs in East Harlem (prescribed methadone, 54.4% in East Harlem vs. 10.4% in Bayamón; $p<0.001$; non-prescribed, 21.3% in East Harlem vs. 3.7% in Bayamón, $p <0.001$).<br>• IDUs in Bayamón were more likely to report injection of cocaine alone and of heroin and cocaine together (cocaine alone, 46.3% in East Harlem vs. 66.6% in Bayamón; $p< .001$; heroin and cocaine together, 53.9% in East Harlem vs. 91.1% in Bayamón; $p < .001$).<br>• The maximum amount of drug solution injected also differed in the two groups of IDUs. IDUs in Bayamón reported higher maximum amounts of drug solution than IDUs in East Harlem.<br>• Younger IDUs injected more frequently than their older counterparts and even after controlling for the drug use factors, the only demographic/psychosocial factor that remained significantly associated with frequency of injection was age.<br>• Homelessness was also found to significantly increase the expected frequency of injection by 14% ($p= 0.019$).<br>• Injection of cocaine alone and injection of speedballs were both found to increase the expected frequency of injection by about 30% ($p <0.001$ in both cases). |

# Chapter 3: Methods

This chapter describes the research question, hypothesis, study aims, study design, study population, interviewing sites description, data collection and the variables that were selected for the study. It also discusses the statistical analyses that were conducted to evaluate the study hypothesis.

## 3.1 Research Question

Is the physical and mental health status among on-the-street and transitionally homeless worse than the physical and mental health status of housed individuals attending community-based organizations that offer services for homeless people in San Juan, Puerto Rico?

## 3.2 Hypothesis

The physical and mental health status among on-the-street and transitionally homeless is worse than the physical and mental health status of housed individuals attending community-based organizations that offer services for homeless people in San Juan, Puerto Rico.

## 3.3 Study Aims

### 3.3.1 General Aim

Assess the association between health status and homeless chronicity among individuals attending community-based organizations that offer services for homeless people in San Juan, Puerto Rico.

### 3.3.2 Specific Aims

- Describe the population under study according to socio-demographic characteristics, health related factors, drug use practices and access to health care.
- Estimate the prevalence of housed, transitionally housed and on-the-street homeless attending community-based organizations that offer services for the homeless in San Juan, Puerto Rico.
- Calculate the SF-36 Health Survey scores of individuals attending community-based organizations that offer services for homeless people in San Juan, Puerto Rico.
- Compute the SF-36 Health Survey scores according to residential status among individuals attending community-based organizations that offer services for the homeless in San Juan, Puerto Rico.
- Estimate the magnitude of the association between health status and homeless chronicity among individuals attending community-based organizations that offer services for homeless people in San Juan, Puerto Rico.
- Estimate the magnitude of the association between health status and homeless chronicity adjusting for potential confounders such as socio-demographic characteristics, health related factors, drug use practices and access to health care.

## 3.4 Study design

A cross-sectional study was used to accomplish the study aims. This type of study design allowed the assessment of exposure (residential status) and outcome (health status) simultaneously in a shorter period of time compared to other study designs. The analytical nature of cross-sectional studies allows generating hypotheses and estimating the magnitude of the associations of interest. Data from cross-sectional studies can be used to assess the association between possible risk factors and to identify patterns that could suggest a need for additional study designs.

## 3.5 Study population

Individuals were selected from community-based organizations that offer services to homeless in San Juan, Puerto Rico. A convenience sample of 100 individuals was selected using the following inclusion and exclusion criteria:

*Inclusion criteria*

Participants had to be at least 21 years of age, currently participating in a program that offers services to homeless in San Juan, Puerto Rico, and cognitively able to provide informed consent.

*Exclusion criteria*

Participants less than 21 years and not currently participating at a program that offers services to homeless in San Juan, Puerto Rico were excluded. Subjects cognitively unable to provide informed consent were also excluded.

The eligibility process was done on-site using the pre-established inclusion and exclusion criteria. All eligible and consenting individuals constituted the study sample.

## 3.6 Interviewing sites

Two recruitment venues (*La Fondita de Jesús* and *Las Duchas*) were selected based on convenience from a list of institutions that offers services to homeless in San Juan, Puerto Rico. An initial assessment per site was done to assure authorization of facility coordinators, sufficient number of participants and appropriate space for interviewing. A private setting was arranged per site to assure the interviewer and interviewee a comfortable space free of interference. The interviewing process was conducted between October 2008 and January 2009.

### 3.6.1 *Las Duchas*

As part of an initiative to alleviate people in need, *Las Duchas* - located in the community *La Perla* - has taken the tremendous task since 2001 to serve homeless people in San Juan, Puerto Rico. This non-profit organization operates with donations, volunteer work and is sustained by money collected on bazaars. Its mission is to create a homely and welcoming institution based on mutual respect, with the objective to achieve an effective community reintegration of its participants. Additional details of these institutions are described below:

| | |
|---|---|
| Type of institution: | Non-profit, community and faith-based organization |
| Target population: | Homeless individuals |
| Location: | Comunidad La Perla, Callejón Padre Venard, San Juan, PR |
| Schedule: | Monday – Wednesday – Friday |
| Contacts: | Ramonita Pons (Administrator)<br>787-725-4651<br>lasduchas@gmail.com<br>http://www.lasduchas.org/Las_Duchas/Sobre_Nosotros.html |

Services offered:

1. place A to shower
2. Clean clothes
3. Personal hygiene items
4. Basic medical services

Statistics (updated in 2008):

| | |
|---|---|
| Number registered participants | 1,066 |
| New participants from 2007 to 2008 | 100 |
| Average people serve per day | 36 |
| Showers taken | 3,366 |

### 3.6.2 *La Fondita de Jesús*

For nearly 25 years, this organization has been providing services to homeless individuals and its adjacent communities. It started as a small initiative of four women concerned by homelessness in Santurce, Puerto Rico. Now, it is a successful organization that serves nearly 2,500 participants, employs 53 people and collaborates with more than 200 volunteers. Additional details of these institutions are described below:

Type of institution: Non-profit, community and faith-based organization

Target population: Homeless individuals and the community *El Gandúl*, which benefits from a computer center, library and thrift store.

Localization: Calle Monserrate Parada 16 ½ Santurce, Puerto Rico

Schedule: Monday – Saturday

Contacts: Mónica López
Basic Services Coordinator
787-724-4051
mlopez@lafonditadejesus.org
http://www.lafonditadejesus.org

Services offered:

- *Puerta de Jesús*: Transitory housing program for 12 people. Targeted to homeless individuals that could still be using drugs.
- *Pueblito de Jesús*: Transitory and permanent housing program for 25 homeless people in drug or alcohol abstinence.
- *Puerta al Cambio*: Offers health and social services to facilitate the community integration of chronic homeless individuals. Among the services provided are: food, hygiene and social services; job seeking services, drug addiction counseling, among others.
- *Conexión Saludable*: Alliance with public and private health sectors to ensure service access to homeless people.
- *Integración a la comunidad*: Program that offers an integrated physical health, psycho-social, community and spiritual service aimed to homeless individuals. Its main purpose is to strengthen useful life skills that enable the participants to find and maintain housing and employment for effective community integration.
- *Centro de Oportunidades Comunitarias*: Computer center for community residents and participants. It also provides help for those seeking housing or employment.
- *Vivero Nuestro Jardín*: Commercial nursery garden run by participants
- *Oradores de la Calle*: Program that offers participants the opportunity to share their personal experiences through interactive activities, with the mission to educate and sensitize people about the hardships of homelessness, stereotypes and false conceptions.

- *Taller de Arte*: Art workshop where participants have the opportunity to create, expose and sell their artworks.
- *Biblioteca de Todos*: Library and computer center for the use of participants and community residents.
- *Tiendita El Cielito de Jesús*: Thrift store that offers the opportunity of employment to participants and a sustainable activity for the organization.

Statistics (for the period of 2004-2005):

| | |
|---|---|
| Basic Services | |
| Active cases | 2,100 |
| Food | 2,996 |
| Showers | 754 |
| Clothes | 1,081 |
| Laundry services | 373 |
| Lockers | 217 |
| Personal hygiene and health products | 2,100 |
| Integrated health services | |
| Active services | 471 |
| Mental health | 80 |
| Case management | 176 |
| Medical services | 104 |
| Methadone | 13 |
| Specialized medical services | 7 |
| Additional services | |
| Government health insurance | 86 |
| Food aid program | 82 |
| Economic assistantship | 82 |
| Social welfare program | 18 |
| Legal services | 12 |
| Housing | |
| Transitory - *Pueblito de Jesús* | 15 |
| Permanent – *Pueblito de Jesús* | 10 |
| Transitory – *Puerta al Cambio* | 12 |
| Emergency shelters | 83 |
| Transitory and permanent | 153 |
| Job seeking services | 132 |

## 3.7 Data collection

### 3.7.1 Questionnaire description

A structured questionnaire was developed for face-to-face interviews. The instrument had five sections: (A) Socio-demographic Information, (B) Medical History, (C) SF-36 Health Survey (v1.0), (D) Drug Use Practices, and (E) Interviewer's Comments. Questions regarding socio-demographic characteristics, medical history and drug use practices were obtained from questionnaires previously used in population-based studies in Puerto Rico (Reyes et al., 2007; Robles et al., 1992). The estimated interviewing time was 1.5 hours.

### 3.7.2 SF-36 Health Survey

To assess the physical and mental health status of participants, the 36-Item Short Form Health Survey (SF-36) version 1.0 was used (Figure 3.1). This questionnaire was designed as a generic indicator of health status. It is applicable to a wide range of types and severities of health conditions and is not specific to an age group. The SF-36 has proven useful in comparing: general and specific populations, the relative burden of different medical conditions, the health benefits produced by a wide range of different treatments, and the differences between sick and well patients (Tsui et al., 2007; Kertesz et al., 2005; Marrero et al., 2005; Riley et al., 2003; Riley et al., 2003; Ware, 2000).

*Questionnaire structure*

This multi-purpose health survey with 36 questions yields an 8-scale profile of scores (Physical Functioning, Role-Physical, Bodily Pain, General Health,

Vitality, Social Functioning, Role-Emotional and Mental Health) as well as physical and mental health summary measures (Physical Component Summary-PCS; Mental Component Summary-MCS). The questionnaire generally takes ten minutes to complete and uses a recall period of four weeks. It may be self-administered, mailed or used in personal and telephone interviews. Non-response rates have averaged 3.9% (Ware, 2000).

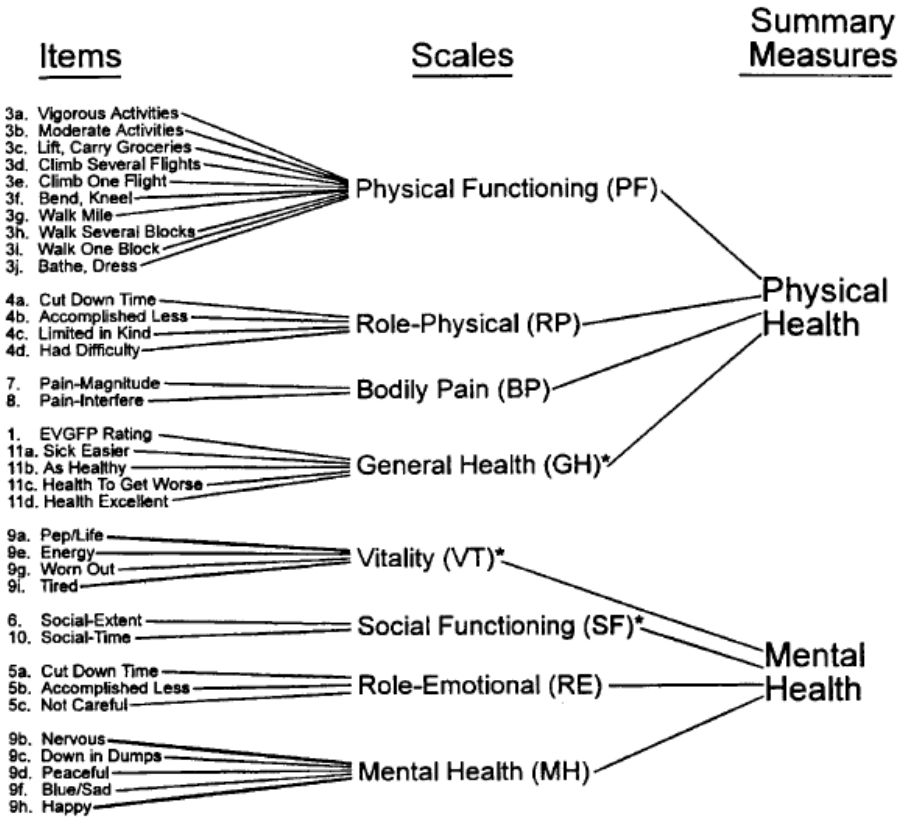


Figure 3.1: SF-36 Health Survey Model (Ware, 2000)

*Reliability and Validity*

The reliability of the sub-scales and summary measures has been estimated using both internal consistency and test-retest methods. Reliability estimates for

physical and mental summary scores usually exceed 0.90, and the median reliability coefficients for each of the eight scales has been greater than 0.80 except for Social Functioning, which has a median reliability across studies of 0.76 (Ware, 2000). A study done by Riley et al. in 2003 with HIV-infected homeless and marginally housed individuals showed that the reliability coefficients in their study exceeded 0.70 (range: 0.77-0.90). The content of the SF-36 has been compared with other generic health surveys indicating that the SF-36 includes eight of the most frequently measured health concepts. Predictive studies of validity have linked SF-36 scales and summary measures to utilization of health care services, the clinical course of depression, loss of job within one year and five-year survival (Ware, 2000).

*Spanish translation*

The International Quality of Life Assessment (IQOLA) Project translated, validated, and normed the SF-36 Health Survey for use in multinational clinical trials and other international studies. It was generally adopted because of its brevity and its comprehensiveness (Ware, 2000). First, translation of the questionnaire followed a standard protocol, including multiple forward and backward translations. Qualitative and quantitative methods were used to evaluate the quality of the translation and its conceptual equivalence with the original survey. Second, formal psychometric tests of scaling assumptions and scoring assumptions were conducted prior to publication of a translation. Third, data from clinical trials and other studies were analyzed to address issues of validity and comparability across countries. The

Spanish version of the questionnaire has been used in research studies in Puerto Rico for populations with specific needs like drug users (Marrero et al., 2005).

### 3.7.3 Data collection methods

Face-to-face interviews were selected as the method for data collection. Considering the type of population under study, telephone or auto-administered questionnaires were not suitable. Personal interviews improve response rates, questionnaire completion and appraisal of sensitive and complex questions. Self-report for drug use has been proved effective as mentioned in a study by Finlinson and colleagues: "The validity of self-reported drug use has been examined by a number of researchers (Harrison et al., 1993), who found self-reports provided estimates of use generally consistent with external sources of information (e.g., biochemical measures)". Rosay and colleagues (2000) concluded that differences across demographic groups in self-reported drug use are "relatively rare" when factors such as gender, race, age, and drug type are controlled.

The interview process started with the explanation of the study aims to the participants. Verbal explanation of the Health Insurance Portability and Accountability Act (HIPAA) and Institutional Review Board (IRB) informed consent forms were discussed with each participant. Those who met the inclusion criteria were selected to be interviewed. After completion and revision of the questionnaire, all the pertinent documents were sealed in an envelope until data entry.

## 3.8 Study variables

### 3.8.1 Physical and Mental Health Status (dependent variable)

The main outcome measurement was assessed using the 36-item Short Form Health Survey version 1.0 (SF-36). Through eight sub-scales and two summary measures, this questionnaire evaluated the physical and mental health status of the study participants. The survey collected information on: physical functioning (PF), role limitations due to physical (RP) and emotional (RE) problems, social functioning (SF), bodily pain (BP), vitality (VT) and mental health (MH). These sub-scales were combined to create two summary scales, a physical composite score (PCS) and a mental composite score (MCS). Each sub-scale generated a continuous variable that ranged from 0 to 100. Norm-based scores below 50 indicated a health status below average.

### 3.8.2 Residential Status (independent variable)

Categorical variable that defined residential status as individuals who were: (1) housed, (2) transitionally housed (living with friends, family or others but considering themselves homeless) or (3) on-the-street homeless (living on the street or in a shelter) at the time of the interview (Reyes et al., 2005).

#### 3.8.2.1 Self-perception of homelessness

Categorical variable (Yes/No) that indicated if the individual considered himself/herself homeless.

#### 3.8.2.2 Lived on the streets previously

Categorical variable (Yes/No) that indicated if the individual had lived on the streets at some time of their lives.

*Number of times lived on the streets*

Continuous variable that assessed the number of times the individual lived on the streets, if "yes" was answered in the previous question.

*Longest time lived on the streets*

Continuous variable that assessed the longest period lived on the streets (in years).

### 3.8.3 Control variables

#### 3.8.3.1 Socio-Demographic Characteristics

*Sex*

Categorical variable that indicated the individual's sex:

1 = Male

2 = Female

*Age*

Continuous variable that indicated the age in years at the time of the interview

*Education*

Ordinal variable that indicated the highest educational degree attained:

1 = First grade

.

.

.

12 = Twelfth grade

13 = Went to college but never graduated

14 = Associate's degree

15 = Bachelor's degree

16 = Master's degree

17 = Doctorate

*Income*

Categorical variable that indicated source of income in the past year. Categories were not mutually exclusive:

1 = Salary of a job or business

2 = Welfare or economic aid

3 = Social Security or incapacity

4 = Unemployment

5 = Money from family or friends

6 = Odd jobs on the streets (collecting cans, asking for money, etc)

7 = Children's welfare or children's food aid

8 = Money from illegal activity

#### 3.8.3.2 Medical History

*Disease diagnosis*

Categorical variable (Yes/No) that indicated a lifetime physician diagnosis of the following conditions:

1. HIV / AIDS

2. Hepatitis C
3. Hepatitis B
4. Tuberculosis
5. Depression
6. Anxiety
7. Physical trauma (defined as having experienced any accidents or victimizations during the past year that could have caused any fractures)

*Age at diagnosis*

Continuous variable that indicated the age in years at which the individual was diagnosed with any of the conditions described above.

*Medical treatment*

Categorical variable (Yes/No) that indicated if the individual received any medical treatment for the conditions described above.

*Recovery*

Categorical variable (Yes/No) that indicated if the individual recovered or was cured from the conditions described above.

#### 3.8.3.3 Access to Health Care

*Drug or alcohol treatment*

Categorical variable (Yes/No) that indicated if the individual received drug or alcohol rehabilitation treatment at some time of his/her live.

*Last medical visit*

Continuous variable that indicated the date of last medical visit.

*Unable to access health care services*

Categorical variable (Yes/No) that evaluated access to health care services.

*Source of health care*

Categorical variable that indicated the main source of health care:

1 = Physician's office

2 = Emergency room

3 = Outpatient department

4 = Community-based organizations

*Health care coverage*

Categorical variable that indicated the type of health care coverage the individual had at the time of the interview:

1 = None

2 = Public

3 = Private

*Tobacco use*

Categorical variable (Yes/No) that indicated if the individual had used tobacco.

*Frequency of use*

Continuous variable that indicated the average number of cigarettes smoked in one day.

*Alcohol use*

Categorical variable (Yes/No) that indicated if the individual had consumed alcohol.

*Frequency of use*

Ordinal variable that indicated the frequency of alcohol consumption in the past 30 days:

1 = Everyday

2 = 4 to 6 times a week

3 = 1 to 3 times a week

4 = A few times a month

5 = Less than once a month

#### 3.8.3.4 Drug Use Practices

*Drug use*

Categorical variable (Yes/No) that indicated the type of drug used in the past 12 months**:**

1. Marijuana
2. Cocaine (inhaled, injected or smoked)
3. Crack
4. Heroine (inhaled, injected or smoked)
5. Speedball (injected mix of cocaine and heroine)
6. Stimulants (amphetamines; e.g. *Ecstasy, Adderall, Ritalin*)
7. Sedatives / analgesics (e.g. *Xanax, Valium, Percocet, Codeine, Demeron, Xylazine*)

*Frequency of drug use*

Ordinal variable that indicated the frequency of drug use in the past 12 months:

1 = More than once daily

2 = Once daily

3 = More than once a week

4 = Once a week

5 = More than once a month

6 = Once a month

*Polydrug use*

Categorical variable (Yes/No) that indicated if the individual used more than two types of drugs.

*Substance use severity*

Categorical variable (Yes/No) that indicated if the individual experienced drug overdose or intoxication.

## 3.9 Statistical analysis

### 3.9.1 Univariate analysis

To describe the study group, descriptive statistics were used. Measurements of location (mean and median) and spread (range, quartiles and standard deviation) were computed for continuous variables. Normality was evaluated using *Shapiro-Wilk Test for Normality* and histograms for visual confirmation.

*SF-36 Health Survey scoring*

The SF-36 health survey generates two summary measure scores: PCS and MCS. Because it has been shown that both measures are two distinct concepts, the two summary scores are used instead of an overall score (Ware, 2000). The SF-36 provides scores for each of the sub-scales and the summary measures. For ease of interpretation each scale is then transformed to a 0-100 scale. Two types of scores are generated: a raw score and a norm-based score. First, each question is given a weighted score. A transformation is done to generate the raw scores using the following formula:

$$\textit{Transformation scale} = \frac{\text{(Observed score – Lowest possible score)}}{\text{Possible raw score range}} \times 100$$

The norm-based approach adjusts these raw scores using population norms. Z-score transformations are done to standardize the data using a mean of 50 and standard deviation of 10. This method facilitates the scores interpretation; scores below 50 indicates a health status below average. It also allows the comparison of study results to the norms derived from the US population.

### 3.9.2 Bivariate analysis

Associations between categorical variables were assessed using the contingency-table method and *Pearson's Chi-Square Test of Independence*. If at least one expected value in the table was less than five then *Fisher's Exact Test* was employed. To compare continuous variables across residential status, ANOVA's F

test was used to adjust for unequal sample sizes. *Levene's Test for Homogeneity of Variances* was applied to evaluate homocedasticity (D'Agostino et al., 2006).

*Random Intercept Logistic Regression Analysis*

The SF-36 scales were dichotomized using their median values; therefore, the logistic regression model was used to assess the effect of several variables on the health status measured by the SF-36 health survey. The following equation was used:

$$p = \frac{1}{1 + e^{-(\beta_{0j} + \sum \beta_i X_i)}}$$

where:

- $p$ indicates the proportion of cases that scored at or below the median in the SF-36 scores
- $X_i$ indicates the exposure (residential status)
- $\beta_{0j}$ indicates the random effect
- $\beta_i$ indicates the regression coefficient (constant term) associated to $X_i$ (exposure, potential confounders and interaction terms)

In a random effects model it is assumed that there is natural heterogeneity between sites (CBOs), and that this heterogeneity can be modeled by a probabilistic distribution. The random effect was defined as:

$$\beta_{oj} = \gamma_0 + u_{0j}; u_{0j} \sim N(0, {\sigma_{u_o}}^2)$$

where:

- $\gamma_o$ is the average of the intercepts
- $u_{0j}$ is the random effect related with the interviewing site
- ${\sigma_{u_0}}^2$ is the variance of $u_{0j}$
- $N$ is the normal distribution

Simple logistic regressions were used to estimate the prevalence odds ratios (POR) for each of the independent variables. *Likelihood ratio* test and *Wald Chi-Square* test were used to assess the significance of the associations. The following equations were used to estimate the 95% confidence interval for the POR:

$$\left(e^{\hat{\beta}_1 - 1.96 SE\hat{\beta}_1}, e^{\hat{\beta}_1 + 1.96 SE\hat{\beta}_1}\right)$$

An initial screening was done to select the variables for the final PCS and MCS models. Those variables that were statistically associated ($p < 0.05$) to PCS and MCS, respectively, in the bivariate analysis were considered for inclusion into the multivariate analysis.

### 3.9.3 Multivariate analysis

To assess the association between the SF-36 scores and residential status controlling for potential confounder variables, two *Multiple Logistic Regression Models with Random Intercept* were generated. One model was generated for the MCS summary score and another for the PCS summary score. The random intercept model was chosen to control the effect of the interviewing site. Correlation of subjects from the same CBOs arises from their sharing specific but unobserved properties of the respective CBO. Based on these models, the adjusted POR was estimated with 95% confidence level, adjusting for potential confounders and interviewing site.

A previous assessment of interaction terms in the multiple logistic regression models was performed using likelihood ratio tests. Because no significant ($p>0.10$)

interaction terms were found, evaluation of confounding was made. If the crude and adjusted POR were different, the adjusted POR was used for interpretation.

SAS version 9.1 (SAS Institute Inc., Cary, NC) and STATA version 10.0 (StataCorp LP, College Station, TX) statistical programs were used to perform the statistical analyses. The random intercept models were generated with STATA command GLLAMM.

# Chapter 4: Results

This chapter describes the results obtained in the univariate, bivariate and multivariate analyses.

## 4.1 Univariate Analysis

### 4.1.1 Socio-Demographic Characteristics

The overall response rate was 94.3%. The non-response rate per institution was as followed: 4 out of 49 in *Las Duchas* and 2 out of 57 in *La Fondita de Jesús*. Among the 100 study participants, 55 (55.0%) were interviewed in *La Fondita de Jesús* and 45 (45.0%) *Las Duchas* (45%); 93 were males and 7 females (Table 4.1). The average age was 46±11.3 years. More than half of the study sample (62%) had completed a high school education, and 24% reported a college degree or more. The sources of income most commonly reported were welfare (62.0%) and money earned by odd jobs on the streets (52.0%).

Table 4.1: Socio-demographic characteristics of study population

| | Overall (n = 100) | |
|---|---|---|
| | n | % |
| CBO | | |
| *La Fondita de Jesús* | 55 | 55.0 |
| *Las Duchas* | 45 | 45.0 |
| Sex | | |
| Male | 93 | 93.0 |
| Female | 7 | 7.0 |
| Age in years (mean ± SD) | 46.0±11.3 | |
| 21 - 40 | 31 | 31.0 |
| 41 - 60 | 60 | 60.0 |
| 61 - 82 | 9 | 9.0 |

Table 4.1: Socio-demographic characteristics of study population *(Continued)*

| | Overall (n = 100) | |
|---|---|---|
| | n | % |
| Education in years (mean ± SD) | 11.0±3.4 | |
| Less than high school | 38 | 38.0 |
| Completed high school | 25 | 25.0 |
| More than high school | 37 | 37.0 |
| Some college | 13 | 13.0 |
| Associate's degree | 15 | 15.0 |
| Bachelor's degree or more | 9 | 9.0 |
| Source of income* | | |
| Welfare | 62 | 62.0 |
| Odd jobs on the streets | 52 | 52.0 |
| Salary | 33 | 33.0 |
| Social security or incapacity | 11 | 11.0 |
| Family | 7 | 7.0 |
| Illegal activities | 4 | 4.0 |
| Unemployment | 3 | 3.0 |

* Categories are not mutually exclusive

### 4.1.2 Residential Status and Homeless Chronicity

Residential status was distributed as follows: on-the-street homeless represented 56.0% of the sample, housed individuals (35.0%) and transitionally housed (9.0%) (Table 4.2). Still, 64.0% considered themselves homeless, and 91.0% reported living at least once on the streets in the past. For those who disclosed a history of living on the streets, the median number of times lived on the streets was 1.5, with a maximum of 30 times. More than half (69.2%) indicated lasting three years or less living in the streets. Still, the longest time lived on the streets reported was 25 years.

Table 4.2: Residential status and homeless chronicity of study population

| | Overall (n = 100) | |
|---|---|---|
| | n | % |
| Residential status | | |
| On-the-street homeless | 56 | 56.0 |
| Transitionally housed | 9 | 9.0 |
| Housed | 35 | 35.0 |
| Self-perception of homelessness | | |
| Yes | 64 | 64.0 |
| No | 36 | 36.0 |
| Have lived on the streets previously | | |
| Yes | 91 | 91.0 |
| No | 9 | 9.0 |
| Median number of times lived on the streets | 1.5 | |
| Longest time lived on the streets (years) | | |
| ≤ 3 | 63 | 69.2 |
| 4 - 6 | 18 | 19.8 |
| ≥ 7 | 10 | 11.0 |

### 4.1.3 Medical History

Depression was one of the most prevalent (44.4%) self-reported health conditions in the study (Table 4.3). Among those suffering the disease, 75.0% received medical treatment, but only 40.9% noticed any improvement in their health. Anxiety disorder was the third most prevalent health condition reported, with an older age at diagnosis than depression (33.4±15.4 years old and 31.3±13.6 years old, respectively). Unlike depression, the majority of anxiety disorder diagnosed individuals received treatment (81.3%) but were less likely to recover from the disease (34.4%). Individuals with dual diagnoses of depression and anxiety represented 25.3% of the sample; nevertheless, 76.8% had at least one diagnosis for a mental health condition. In addition to highly

prevalent psychiatric diseases, 18.2% of the study sample self-reported a physician diagnosis of hepatitis C at an average age of 40±12.6 years old. Seven out of 18 (38.9%) participants received treatment for this infection. HIV seropositivity followed as the most prevalent with 8.1% of the total sample.

Table 4.3: Self-reported diagnosed health conditions of study population

| | Overall (n = 99) | |
|---|---|---|
| | n | % |
| Depression | | |
| Yes | 44 | 44.4 |
| No | 55 | 55.6 |
| Age at diagnosis (mean ± SD) | 31.3±13.6 | |
| Received treatment | 33 | 75.0 |
| Recovered from disease | 18 | 40.9 |
| Physical Trauma | | |
| Yes | 44 | 44.4 |
| No | 55 | 55.6 |
| Age at diagnosis (mean ± SD) | 38.6±14.0 | |
| Received treatment | 37 | 84.1 |
| Recovered from trauma | 27 | 61.4 |
| Anxiety Disorder | | |
| Yes | 32 | 32.3 |
| No | 67 | 67.7 |
| Age at diagnosis (mean ± SD) | 33.4±15.4 | |
| Received treatment | 26 | 81.3 |
| Recovered from disease | 11 | 34.4 |
| Hepatitis C | | |
| Yes | 18 | 18.2 |
| No | 81 | 81.8 |
| Age at diagnosis (mean ± SD) | 39.9±12.6 | |
| Received treatment | 7 | 38.9 |
| HIV / AIDS | | |
| Yes | 8 | 8.1 |
| No | 91 | 91.9 |
| Age at diagnosis (mean ± SD) | 34.4±7.3 | |
| Received treatment | 6 | 75.0 |

Table 4.3: Self-reported diagnosed health conditions of study population *(Continued)*

| | Overall (n = 99) | |
|---|---|---|
| | n | % |
| Tuberculosis | | |
| Yes | 4 | 4.0 |
| No | 95 | 96.0 |
| Age at diagnosis (mean ± SD) | 20.5±16.8 | |
| Received treatment | 4 | 100.0 |
| Recovered from disease | 4 | 100.0 |
| Hepatitis B | | |
| Yes | 2 | 2.0 |
| No | 97 | 99.0 |
| Age at diagnosis (mean ± SD) | 36.5±17.7 | |
| Received treatment | 2 | 100.0 |
| Recovered from disease | 2 | 100.0 |

### 4.1.4 Access to Health Care

Access to health care factors revealed that 36.0% of all individuals were unable to receive any medical health care service in the past 12 months (Table 4.4). Of those who could, 12.0% had their last medical visit more than a year ago. The majority of individuals (73.0%) had a public health insurance (*Tarjeta de Salud del Estado Libre Asociado de Puerto Rico*-"Reforma de Salud"), as compared to those with private health insurance (4.0%) or uninsured (23.0%). The usual source of medical care was the outpatient department (48.0%) followed by the emergency room (28.0%), physician's office (16.0%) and CBOs (6.0%). Nearly half of the sample perceived that their health status was fair or poor (47.0%). Current smokers (72.0%) consumed an average of 12 cigarettes per day, and 54.0% of the sample considered themselves current alcohol users in the past 30 days. More than half (54.0%) of all individuals in the study had received at

some time of their lives drug or alcohol rehabilitation treatment. Still, 35.0% were current drug users.

Table 4.4: Access to health care factors of study population

| | Overall (n = 100) | |
|---|---|---|
| | n | % |
| Received drug or alcohol treatment | 54 | 54.0 |
| Last medical visit | | |
| Less than a year ago | 84 | 84.0 |
| More than one year ago | 12 | 12.0 |
| Unable to access health care services | 36 | 36.0 |
| Usual source of health care | | |
| Outpatient department* | 48 | 48.0 |
| ER | 28 | 28.0 |
| Physician's office | 16 | 16.0 |
| CBO | 6 | 6.0 |
| Health insurance | | |
| None | 23 | 23.0 |
| Public | 73 | 73.0 |
| Private | 4 | 4.0 |
| Perception of health | | |
| Excellent | 17 | 17.0 |
| Good | 36 | 36.0 |
| Fair | 37 | 37.0 |
| Poor | 10 | 10.0 |
| Current smokers | | |
| Yes | 72 | 72.0 |
| No | 28 | 28.0 |
| Median number of cigarettes per day ($P_{25}$, $P_{75}$) | 7.0 (3.0, 20.0) | |
| Current alcohol drinkers | | |
| Yes | 54 | 54.0 |
| No | 46 | 46.0 |

Table 4.4: Access to health care factors of study population *(Continued)*

| | Overall (n = 100) | |
|---|---|---|
| | n | % |
| Frequency of alcohol consumption | | |
| Everyday | 10 | 18.5 |
| 4 to 6 times a week | 1 | 1.9 |
| 1 to 3 times a week | 25 | 46.3 |
| A few times a month | 13 | 24.1 |
| Less than once a month | 5 | 9.3 |

* "Centro de Diagnóstico y Tratamiento – CDT" specialized in homeless health care

### 4.1.5 Drug Use Practices

Drug users represented 54.0% of the sample, and 34.0% used at least two types of drugs (Table 4.5). The most frequent types of drugs reported were marijuana (57.4%), crack (48.1%) and smoked or inhaled cocaine (35.2%) and heroine (24.1%). Speedball (injected mix of cocaine and heroine) was the most common combination of two drugs used simultaneously (20.4%), and all users reported using it more than once daily. Speedball users also used, on average, two other drugs in addition to speedball.

Table 4.5: History of drug used in the past 12 months by study population

| | Overall (n = 100) | |
|---|---|---|
| | n | % |
| Drug users | | |
| Yes | 54 | 54.0 |
| No | 46 | 46.0 |
| Polydrug users | | |
| Yes | 34 | 63.0 |
| No | 20 | 20.0 |
| Number of drugs used (mean ± SD) | 2.3±1.3 | |
| Types of drugs used* | | |
| Marijuana | 31 | 57.4 |
| Crack | 26 | 48.1 |

Table 4.5: History of drug used in the past 12 months by study population *(Continued)*

| | Overall (n = 100) | |
|---|---|---|
| | n | % |
| Cocaine† | 19 | 35.2 |
| Heroine† | 13 | 24.1 |
| Analgesics / sedatives | 11 | 20.4 |
| Speedball‡ | 10 | 18.5 |
| Amphetamines | 1 | 1.9 |

* Categories were not mutually exclusive
† Inhaled and smoked only.
‡ Injected

Sedative and speedball users reported the most usage of other drugs (3.7 and 3.9, respectively) (Table 4.6). The majority of the study sample indicated a frequency of drug use more than once daily. Overdose was not a usual event among the study participants.

Table 4.6: Frequency and patterns of drug use in the past 12 months among study population

| | Overall (n = 100) | |
|---|---|---|
| | n | % |
| Marijuana (n = 31) | | |
| Frequency of use | | |
| More than once daily | 11 | 35.5 |
| Once a day | 2 | 6.5 |
| More than once a week | 6 | 19.4 |
| Once a week | 1 | 3.2 |
| More than once a month | 7 | 22.6 |
| Once a month | 4 | 12.9 |
| Number of drugs used (mean ± SD) | 2.7±1.4 | |
| Overdose | 4 | 12.9 |
| | | |
| Crack (n = 26) | | |
| Frequency of use | | |
| More than once daily | 16 | 61.5 |
| Once a day | 2 | 7.7 |
| More than once a week | 3 | 11.5 |
| Once a week | 0 | 0 |
| More than once a month | 2 | 7.7 |
| Once a month | 3 | 11.5 |

Table 4.6: Frequency and patterns of drug use in the past 12 months among study population *(Continued)*

| | Overall (n = 100) | |
|---|---|---|
| | n | % |
| Number of drugs used (mean ± SD) | 2.7±1.3 | |
| Overdose | 4 | 15.4 |
| | | |
| Cocaine (n = 19)† | | |
| Frequency of use | | |
| More than once daily | 7 | 36.8 |
| Once a day | 0 | 0 |
| More than once a week | 5 | 26.3 |
| Once a week | 1 | 5.3 |
| More than once a month | 4 | 21.1 |
| Once a month | 2 | 10.5 |
| Number of drugs used (mean ± SD) | 2.3±1.3 | |
| Overdose | 3 | 15.8 |
| | | |
| Heroine (n = 13)† | | |
| Frequency of use | | |
| More than once daily | 8 | 61.5 |
| Once a day | 0 | 0 |
| More than once a week | 3 | 23.1 |
| Once a week | 0 | 0 |
| More than once a month | 1 | 7.7 |
| Once a month | 1 | 7.7 |
| Number of drugs used (mean ± SD) | 3.0±1.4 | |
| Overdose | 2 | 15.4 |
| | | |
| Analgesics / sedatives (n = 11) | | |
| Frequency of use | | |
| More than once daily | 3 | 27.3 |
| Once a day | 2 | 18.2 |
| More than once a week | 4 | 36.4 |
| Once a week | 1 | 9.1 |
| More than once a month | 0 | 0 |
| Once a month | 1 | 9.1 |
| Number of drugs used (mean ± SD) | 3.7±0.8 | |
| Overdose | 1 | 9.1 |

Table 4.6: Frequency and patterns of drug use in the past 12 months among study population *(Continued)*

| | Overall (n = 100) | |
|---|---|---|
| | n | % |
| Speedball (n = 10)‡ | | |
| Frequency of use | | |
| More than once daily | 10 | 100.0 |
| Once a day | 0 | 0 |
| More than once a week | 0 | 0 |
| Once a week | 0 | 0 |
| More than once a month | 0 | 0 |
| Once a month | 0 | 0 |
| Number of drugs used (mean ± SD) | 3.9±1.1 | |
| Overdose | 1 | 10.0 |

† Inhaled and smoked only.
‡ Injected

### 4.1.6 SF-36 Health Survey

The average scores of the eight SF-36 sub-scales were below US norms (mean ± SD = 50±10) except for the Vitality sub-scale (53.7±14.7) (Table 4.7). The Physical and Mental Health Summary measures were also slightly below this norm (49.6±11.8 and 42.2±14.4, respectively). The lowest sub-scale score achieved was Social Functioning (35.5±4.2), whereas the highest score was achieved by the Vitality sub-scale (53.7±14.7).

Table 4.7: Descriptive statistics for the SF-36 norm-based scores

| | Overall (n = 100) | | | | | | |
|---|---|---|---|---|---|---|---|
| | Mean | SD* | Min | $P_{25}$ | Median | $P_{75}$ | Max |
| Sub-scales | | | | | | | |
| Physical Functioning | 50.0 | 10.0 | 17.3 | 44.6 | 55.0 | 57.1 | 57.1 |
| Role-Physical | 45.9 | 12.0 | 28.0 | 35.0 | 52.7 | 56.2 | 56.2 |
| Bodily Pain | 47.6 | 14.1 | 19.9 | 33.6 | 46.9 | 62.7 | 62.7 |
| General Health | 46.2 | 13.3 | 17.2 | 34.7 | 47.6 | 56.4 | 64.0 |
| Vitality | 53.7 | 14.7 | 23.0 | 42.0 | 57.4 | 68.0 | 70.4 |
| Social Functioning | 35.5 | 4.2 | 19.1 | 35.4 | 35.4 | 35.4 | 51.7 |
| Role-Emotional | 43.2 | 13.9 | 23.7 | 23.7 | 55.3 | 55.3 | 55.3 |
| Mental Health | 44.7 | 16.6 | 7.3 | 34.5 | 48.2 | 57.3 | 64.1 |

Table 4.7: Descriptive statistics for the SF-36 norm-based scores *(Continued)*

| | Overall (n = 100) | | | | | | |
|---|---|---|---|---|---|---|---|
| | Mean | SD* | Min | $P_{25}$ | Median | $P_{75}$ | Max |
| Summary Measures | | | | | | | |
| Physical Component Summary | 49.6 | 11.8 | 17.3 | 42.1 | 52.3 | 58.9 | 69.7 |
| Mental Component Summary | 42.2 | 14.4 | 9.1 | 29.5 | 46.2 | 54.0 | 68.9 |

* SD: Standard Deviation

## 4.2 Bivariate Analysis

### 4.2.1 SF-36 health status scores by residential status

Housed subjects scored higher in almost all sub-scales and summary measures than on-the-street and transitionally homeless, although not all comparisons were statistically significant (Table 4.8). The Social Functioning sub-scale was the only one where housed individuals scored similar than their counterpart (35.4±3.2 vs 35.5±4.7; p=0.9271); however, these differences were not statistically significant. This sub-scale was also the lowest scored for all individuals. The highest mean score was reported for the vitality sub-scale (51.5±15.9; 57.9±11.3, respectively).

Table 4.8: SF-36 norm-based mean scores by residential status

| Scales | On-the-street and transitionally homeless (n = 65) | Housed (n = 35) | p-value |
|---|---|---|---|
| | mean ± SD | mean ± SD | |
| Sub-scales | | | |
| Physical Functioning | 49.4 ± 10.3 | 51.2 ± 9.6 | 0.4045 |
| Role-Physical | 44.3 ± 12.4 | 48.9 ± 10.6 | 0.0625 |
| Bodily Pain | 45.2 ± 14.6 | 52.0 ± 12.3 | 0.0203 |
| General Health | 44.3 ± 13.8 | 49.6 ± 11.8 | 0.0602 |
| Vitality | 51.5 ± 15.9 | 57.9 ± 11.3 | 0.0387 |
| Social Functioning | 35.5 ± 4.7 | 35.4 ± 3.2 | 0.9271 |
| Role-Emotional | 41.1 ± 14.2 | 47.2 ± 12.5 | 0.0348 |
| Mental Health | 40.7 ± 17.8 | 52.0 ± 11.2 | 0.0009 |
| Summary Measures | | | |
| Physical Component Summary | 48.7 ± 12.2 | 51.1 ± 11.0 | 0.3374 |
| Mental Component Summary | 39.4 ± 15.3 | 47.3 ± 10.8 | 0.0081 |

### 4.2.2 Control variables by residential status

**Socio-demographics by residential status**

Residential status differed significantly ($p<0.01$) according to CBO (Table 4.9). More individuals from *Las Duchas* (60.0%) reported living in the streets, whereas 82.9% of *La Fondita de Jesús* participants reported being housed. Housed individuals were slightly older than their counterparts (47.2±12.6 and 45.4±10.6, respectively, $p=0.6513$) but did not reach statistical significance. Subjects living on the streets demonstrated to have higher education than housed subjects, but the difference was not statistically significant ($p=0.7632$). Thirty nine percent on the streets indicated having more than high school, compared to 34% of the housed individuals. More housed individuals relied on salary (40% vs. 66%, respectively, $p=0.2747$) and welfare assistantships (29% vs. 60%, respectively, $p=0.5744$) than on-the-street and transitionally homeless individuals, which depended more on odd jobs on the streets (55% vs. 46%, respectively, $p=0.3559$); however, these differences were not statistically significant.

Table 4.9: Socio-demographic characteristics associated with residential status among study population

| | On-the-street and transitionally homeless (n = 65) | | Housed (n = 35) | | |
|---|---|---|---|---|---|
| | n | % | n | % | P-value |
| CBO | | | | | <0.0001 |
| *La Fondita de Jesús* | 26 | 40.0 | 29 | 82.9 | |
| *Las Duchas* | 39 | 60.0 | 6 | 17.1 | |
| Sex | | | | | 0.6513 |
| Male | 61 | 93.9 | 32 | 91.4 | |
| Female | 4 | 6.2 | 3 | 8.6 | |

Table 4.9: Socio-demographic characteristics associated with residential status among study population *(Continued)*

| | On-the-street and transitionally homeless (n = 65) | | Housed (n = 35) | | |
|---|---|---|---|---|---|
| | n | % | n | % | P-value |
| Age in years (mean ± SD) | 45.4±10.6 | | 47.2±12.6 | | 0.3971 |
| 21 - 40 | 21 | 32.3 | 10 | 28.6 | |
| 41 - 60 | 40 | 61.5 | 20 | 57.1 | |
| 61 - 82 | 4 | 6.2 | 5 | 14.3 | |
| Education in years (mean ± SD) | 11.3±3.3 | | 10.6±3.5 | | 0.7632 |
| Less than high school | 23 | 35.4 | 15 | 42.9 | |
| Completed high school | 17 | 26.2 | 8 | 22.9 | |
| More than high school | | | | | |
| Some college | 8 | 12.3 | 5 | 14.3 | |
| Associate's degree | 12 | 18.5 | 3 | 8.6 | |
| Bachelor's degree or more | 5 | 7.7 | 4 | 11.4 | |
| Source of income* | | | | | |
| Welfare | 39 | 60.0 | 23 | 65.7 | 0.5744 |
| Odd jobs on the streets | 36 | 55.4 | 16 | 45.7 | 0.3559 |
| Salary | 19 | 29.2 | 14 | 40.0 | 0.2747 |
| Social security or incapacity | 6 | 9.2 | 5 | 14.3 | 0.5094 |

* Categories were not mutually exclusive

**Homeless chronicity by residential status**

Self-perception of being homeless differed significantly ($p<0.01$) across residential status categories (Table 4.10). Nearly 29% of housed individuals perceived themselves as homeless compared to 83.1% of on-the-street and transitionally homeless. Eighty percent of the housed individuals had been recently (less than three years) living in the disclosed conditions, whereas 75.4% of their counterparts were also recently on the streets. Having a past experience of living on the streets was associated to residential status ($p=0.0008$). Also, housed individuals reported experiencing the longest time (more than seven years)

living on the streets in the past than their counterparts (14.8% vs. 9.4%, respectively) however, these differences did not reach statistical significance (p=0.6326).

Table 4.10: Homelessness chronicity associated with residential status among study population

| | On-the-street and transitionally homeless (n = 65) | | Housed (n = 35) | | |
|---|---|---|---|---|---|
| | n | % | n | % | P-value |
| Self-perception of homelessness | 54 | 83.1 | 10 | 28.6 | <0.0001 |
| Longest time living in disclosed conditions (mean ± SD) | 2.3±3.3 | | 3.4±7.6 | | 0.9327 |
| ≤ 3 years | 49 | 75.4 | 28 | 80.0 | |
| 4 - 6 years | 11 | 16.9 | 5 | 14.3 | |
| ≥ 7 years | 5 | 7.7 | 2 | 5.7 | |
| Have lived on the streets previously | 64 | 98.5 | 27 | 77.1 | 0.0008 |
| Number of times lived on the streets (median) | 2.0 | | 1.0 | | 0.2625 |
| Longest time lived on the streets (mean ± SD) | 1.4±0.7 | | 1.4±0.8 | | 0.6326 |
| ≤ 3 years | 44 | 68.8 | 19 | 70.4 | |
| 4 - 6 years | 14 | 21.9 | 4 | 14.8 | |
| ≥ 7 years | 6 | 9.4 | 4 | 14.8 | |

**Medical history by residential status**

Besides having a high prevalence of psychiatric conditions, these were also significantly associated to residential status (Table 4.11). Anxiety disorder was statistically associated (p=0.0233) to residential status, whereas depression reached marginal significance (p=0.0799). Having reported a past physical trauma was also significantly associated with the exposure variable (p=0.0295). On-the-street and transitionally homeless reported suffering more from HCV, but the difference was not statistically significant (18.5% vs.

17.1%, p=0.9205). Also, anxiety was more prevalent among on-the-street and transitionally homeless (40.0% vs. 17.1%, p=0.0233), and physical trauma (52.3% vs. 28.6%, p=0.0295). Housed individuals reported a slightly higher HIV prevalence (8.6% vs. 7.7%, p>0.9999), but the difference was not statistically significant.

Table 4.11: Self-reported diagnosed health conditions associated with residential status among study population

| | On-the-street and transitionally homeless (n = 65) | | Housed (n = 35) | | |
|---|---|---|---|---|---|
| | n | % | n | % | P-value |
| HIV / AIDS | 5 | 7.7 | 3 | 8.6 | >0.9999 |
| Age at diagnosis (mean ± SD) | 33.0±9.1 | | 36.7±2.5 | | |
| Received treatment | 3 | 4.6 | 3 | 100.0 | |
| Hepatitis C | 12 | 18.5 | 6 | 17.1 | 0.9205 |
| Age at diagnosis (mean ± SD) | 40.5±13.2 | | 38.8±12.4 | | |
| Received treatment | 4 | 6.2 | 3 | 50.0 | |
| Depression | 33 | 50.8 | 11 | 31.4 | 0.0799 |
| Age at diagnosis (mean ± SD) | 28.9±11.9 | | 38.1±16.2 | | |
| Received treatment | 25 | 38.5 | 8 | 72.7 | |
| Recovered from disease | 11 | 16.9 | 7 | 63.6 | |
| Anxiety disorder | 26 | 40.0 | 6 | 17.1 | 0.0233 |
| Age at diagnosis (mean ± SD) | 32.1±15.3 | | 39.0±15.4 | | |
| Received treatment | 21 | 32.3 | 5 | 83.3 | |
| Recovered from disease | 7 | 10.8 | 4 | 66.7 | |
| Physical trauma | 34 | 52.3 | 10 | 28.6 | 0.0295 |
| Age at diagnosis (mean ± SD) | 39.2±14.4 | | 36.5±13.0 | | |
| Received treatment | 20 | 44.6 | 8 | 80.0 | |
| Recovered from trauma | 20 | 30.8 | 7 | 70.0 | |

**Access to health care by residential status**

Receiving drug or alcohol rehabilitation treatment in the past showed to be associated with residential status (p=0.0393) (Table 4.12). More homeless individuals indicated that

they were part of a rehabilitation program for the use of drugs or alcohol than housed individuals (61.5% vs. 40.0%, respectively). Housed individuals reported more being unable to access health care (40.0% vs. 33.9%, p=0.5409) than on-the-street and transitionally homeless. More homeless than housed participants sought health care services at the emergency department (30.2% vs. 25.7%, respectively). A few more homeless than housed individuals (24.6% vs. 20.0%, p=0.8539) did not have health insurance. However, these differences were not statistically significant.

Table 4.12: Access to health care factors associated with residential status among study population.

| | On-the-street and transitionally homeless (n = 65) | | Housed (n = 35) | | |
|---|---|---|---|---|---|
| | n | % | n | % | P-value |
| Received drug or alcohol treatment | 40 | 61.5 | 14 | 40.0 | 0.0393 |
| Last medical visit | | | | | >0.999 |
| Less than a year ago | 54 | 87.1 | 30 | 85.7 | |
| More than one year ago | 8 | 12.9 | 4 | 11.4 | |
| Unable to access health care services | 22 | 33.9 | 14 | 40.0 | 0.5409 |
| Usual source of health care | | | | | 0.5058 |
| Outpatient department* | 31 | 49.2 | 17 | 48.6 | |
| ER | 19 | 30.2 | 9 | 25.7 | |
| Physician's office | 8 | 12.7 | 8 | 22.9 | |
| CBOs | 5 | 7.9 | 1 | 2.9 | |
| Health insurance | | | | | 0.8539 |
| None | 16 | 24.6 | 7 | 20.0 | |
| Public | 46 | 70.8 | 27 | 77.1 | |
| Private | 3 | 4.6 | 1 | 2.9 | |
| Current smokers | 46 | 70.8 | 26 | 74.3 | 0.7087 |
| Current alcohol drinkers | 34 | 52.3 | 20 | 57.1 | 0.6436 |

* "Centro de Diagnóstico y Tratamiento – CDT" specialized in homeless health care

**Drug use practices by residential status**

Homeless individuals reported more drug (58.5% vs. 45.7%, respectively, p=0.2225) and polydrug use than their housed counterparts (68.4% vs. 50.0%, respectively, p=0.2005) (Table 4.13). In addition, they indicated using more injected drugs like speedball (23.7% vs. 6.3%, p=0.0780). Housed participants used more non-injected drugs like marijuana (62.5% versus 55.3%, p=0.4217), crack (50.0% vs. 47.4%, p=0.3751), and inhaled cocaine (43.8% vs. 31.6%, p=0.7384). However, none of these differences were statistically significant.

Table 4.13: History of drug use in the past 12 months according to residential status among study population

| | On-the-street and transitionally homeless (n = 65) | | Housed (n = 35) | | |
|---|---|---|---|---|---|
| | n | % | n | % | P-value |
| Drug users | 38 | 58.5 | 16 | 45.7 | 0.2225 |
| Polydrug users | 26 | 68.4 | 8 | 50.0 | 0.2005 |
| Number of drugs used (mean ± SD) | 2.5±1.3 | | 2.0±1.2 | | 0.0992 |
| Types of drugs used* | | | | | |
| Marijuana | 21 | 55.3 | 10 | 62.5 | 0.4217 |
| Crack | 18 | 47.4 | 8 | 50.0 | 0.3751 |
| Cocaine** | 12 | 31.6 | 7 | 43.8 | 0.7384 |
| Heroine** | 10 | 26.3 | 3 | 18.8 | 0.3342 |
| Speedball† | 9 | 23.7 | 1 | 6.3 | 0.0780 |
| Analgesics / sedatives | 9 | 23.7 | 2 | 12.5 | 0.1854 |

* Categories were not mutually exclusive
** Inhaled and smoked only
† Injected

### 4.2.3 Unadjusted prevalence odds ratios for mental health status

Participants interviewed at *Las Duchas* were 2.29 (95% CI: 1.02 – 5.13) more likely to attain a MCS score at or below the median than participants from *La Fondita de Jesús* (Table 4.14). There was a marginal significance for age (p=0.0817) and education (0.0907). Older age was marginally protective from scoring a mental health status at or below the median than having a younger age (61-82 vs 21-40, p=0.0817). There were no significant associations between a mental health score at or below the median and sex, welfare, having an odd job or receiving a salary.

Table 4.14: POR estimation to assess the association of socio-demographic factors and a SF-36 mental health score (MCS) at or below the median

| | $POR_{unadjusted}$ | 95% CI | P-value |
|---|---|---|---|
| Site | | | |
| *La Fondita de Jesús*[*] | 1.00 | | |
| *Las Duchas* | 2.29 | 1.02 – 5.13 | 0.0439 |
| Sex | | | |
| Female[*] | 1.00 | | |
| Male | 1.31 | 0.28 – 6.16 | 0.7366 |
| Age in years | | | |
| 21 – 40[*] | 1.00 | | |
| 41 - 60 | 0.77 | 0.32 – 1.85 | 0.2988 |
| 61 - 82 | 0.21 | 0.04 – 1.16 | 0.0817 |
| Education | | | |
| Less than high school | 0.40 | 0.16 – 1.01 | 0.0907 |
| Completed high school | 0.66 | 0.24 – 1.84 | 0.9220 |
| More than high school[*] | 1.00 | | |
| Welfare | | | |
| No | 1.86 | 0.82 – 4.23 | 0.1376 |
| Yes[*] | 1.00 | | |
| Odd jobs on the streets | | | |
| No[*] | 1.00 | | |
| Yes | 1.08 | 0.49 – 2.37 | 0.8476 |
| Salary | | | |
| No | 1.39 | 0.60 – 3.22 | 0.4370 |
| Yes[*] | 1.00 | | |

* Reference category
MCS reference category: above the median

On-the-streets and transitionally homeless individuals had almost three-fold (95% CI: 1.22-6.77) greater odds of scoring a mental health status at or below the median than their housed counterparts (Table 4.15). Homeless perception (POR=1.27; 95% CI: 0.56-2.87), living on the streets previously (POR=1.34; 95% CI: 0.34-5.30), and having lived on the streets for seven years or more (POR=1.45; 95% CI: 0.37-5.65) also increased the odds of scoring below the median in the MCS scale; however, these associations were not statistically significant ($p>0.10$).

Table 4.15: POR estimation to assess the association of homeless chronicity and a SF-36 mental health score (MCS) at or below the median.

| | $POR_{unadjusted}$ | 95% CI | P-value |
|---|---|---|---|
| Residential status | | | |
| Housed* | 1.00 | | |
| On-the-streets and transitionally homeless | 2.88 | 1.22 – 6.77 | 0.0157 |
| Self-perception of homelessness | | | |
| No* | 1.00 | | |
| Yes | 1.27 | 0.56 – 2.87 | 0.5714 |
| Have lived on the streets previously | | | |
| No* | 1.00 | | |
| Yes | 1.34 | 0.34 – 5.30 | 0.6808 |
| Number of times lived on the streets | | | |
| Once* | 1.00 | | |
| More than once | 0.84 | 0.37 – 1.92 | 0.6735 |
| Longest time lived on the streets | | | |
| ≤ 3 years* | 1.00 | | |
| 4 - 6 years | 0.97 | 0.34 – 2.77 | 0.7087 |
| ≥ 7 years | 1.45 | 0.37 – 5.65 | 0.5771 |

* Reference category
MCS reference category: above the median

Participants who indicated having a history of depression were 3.47 (95% CI: 1.5–8.0) times more likely to have a mental health status at or below the median than participants who did not have this diagnosis (Table 4.16). Having hepatitis C (POR=2.15; 95% CI: 0.74–6.29) and anxiety disorder (POR=1.94; 95% CI: 0.82–4.58) also increased the odds of scoring a low mental health status score. Having HIV (POR=0.94; 95% CI: 0.22–3.97) decreased these odds, although these associations did not achieve statistical significance.

Table 4.16: POR estimation to assess the association of self-reported diagnosed medical conditions and a SF-36 mental health score (MCS) at or below the median.

| | $POR_{unadjusted}$ | 95% CI | P-value |
|---|---|---|---|
| HIV / AIDS | | | |
| No* | 1.00 | | |
| Yes | 0.94 | 0.22 – 3.97 | 0.9287 |
| Hepatitis C | | | |
| No* | 1.00 | | |
| Yes | 2.15 | 0.74 – 6.29 | 0.1609 |
| Depression | | | |
| No* | 1.00 | | |
| Yes | 3.47 | 1.50 – 8.00 | 0.0035 |
| Anxiety disorder | | | |
| No* | 1.00 | | |
| Yes | 1.94 | 0.82 – 4.58 | 0.1332 |

* Reference category
MCS reference category: above the median

Those participants that disclosed receiving drug or alcohol rehabilitation treatment in the past had 1.49 (95% CI: 0.68–3.28) greater odds of achieving a MCS score at or below the median than participants who did not received any treatment (Table 4.17). Being unable to access health care services increased the odds of scoring a low mental health status score compared to those who were able to access health care services (POR=1.33; 95% CI: 0.59–3.02). Receiving health care at a community-based organization (POR=1.56; 95% CI: 0.22–11.01) and not having health insurance (POR=2.83; 95% CI: 0.32–24.81) also increased the odds of scoring at or below the median in the MCS scale. However, these differences were not statistically significant ($p>0.10$).

Table 4.17: POR estimation to assess the association of access to health care factors and a SF-36 mental health scores (MCS) at or below the median.

| | $POR_{unadjusted}$ | 95% CI | P-value |
|---|---|---|---|
| Received drug or alcohol treatment | | | |
| No* | 1.00 | | |
| Yes | 1.49 | 0.68 – 3.28 | 0.3242 |
| Last medical visit | | | |
| Less than a year ago* | 1.00 | | |
| More than one year ago | 0.62 | 0.18 – 2.11 | 0.4429 |
| Unable to access health care services | | | |
| No* | 1.00 | | |
| Yes | 1.33 | 0.59 – 3.02 | 0.4948 |
| Usual source of health care | | | |
| Physician's office* | 1.00 | | |
| Outpatient department | 0.66 | 0.21 – 2.06 | 0.2495 |
| ER | 0.90 | 0.26 – 3.10 | 0.8215 |
| CBO | 1.56 | 0.22 – 11.01 | 0.4911 |
| Health insurance | | | |
| Private* | 1.00 | | |
| None | 2.83 | 0.32 – 24.81 | 0.0957 |
| Public | 0.78 | 0.10 – 5.85 | 0.2015 |

* Reference category
MCS reference category: above the median

Drug users had almost two-fold (95% CI: 0.79-3.88) greater odds of scoring a mental health score below the median than non-drug users (Table 4.18). Polydrug users were 2.72 (95% CI: 1.08-6.86) more likely to achieve a lower MCS score than non-users. Individuals who were analgesics and sedatives users were 13 (95% CI: 1.54 – 110.12) times more likely to score low in the mental health scale compared to those that did not use analgesics or sedatives. The use of marijuana (POR=2.06; 95% CI: 0.81 – 5.21), crack (POR=1.77; 95% CI: 0.62 – 4.69), inhaled heroine (POR=1.52; 95% CI: 0.44 – 5.22) and speedball (POR=5.20; 95% CI: 0.99 – 27.23) also increased the odds of scoring at or below the median in the MCS scale; however, these differences were not statistically significant (p>0.10).

Table 4.18: POR estimation to assess the association of drug use and a SF-36 mental health score (MCS) at or below the median.

| | $POR_{unadjusted}$ | 95% CI | P-value |
|---|---|---|---|
| Drug users | | | |
| No* | 1.00 | | |
| Yes | 1.75 | 0.79 – 3.88 | 0.1663 |
| Polydrug use | | | |
| None* | 1.00 | | |
| One drug | 0.87 | 0.30 – 2.52 | 0.2108 |
| Two or more drugs | 2.72 | 1.08 – 6.86 | 0.0190 |
| Type of drugs used** | | | |
| Marijuana | 2.06 | 0.81 – 5.21 | 0.1276 |
| Crack | 1.77 | 0.62 – 4.69 | 0.2484 |
| Cocaine | 1.17 | 0.40 – 3.42 | 0.7742 |
| Heroine | 1.52 | 0.44 – 5.22 | 0.5091 |
| Speedball | 5.20 | 0.99 – 27.23 | 0.0510 |
| Analgesics / sedatives | 13.00 | 1.54 – 110.12 | 0.0186 |

* Reference category
** Reference category: non-drug users
MCS reference category: above the median

### 4.2.4 Unadjusted prevalence odds ratios for physical health status

Participants interviewed at *Las Duchas* were 33% (95% CI: 0.30 – 1.47) less likely to attain a PCS score at or below the median than participants from *La Fondita de Jesús* (Table 4.19). Older age was also protective from scoring a physical health status below the median compared to those with younger age (61-82 vs. 21-40, p=0.3059). Not receiving a salary (POR=1.90; 95% CI: 0.81–4.43) and being male (POR=2.67; 95% CI: 0.49–14.45) also increased the odds of scoring low in the PCS scale. Nonetheless, these differences were not statistically significant (p>0.10).

Table 4.19: POR estimation to assess the association of socio-demographic factors and a SF-36 physical health score (PCS) at or below the median.

| | $POR_{unadjusted}$ | 95% CI | P-value |
|---|---|---|---|
| Sex | | | |
| Female* | 1.00 | | |
| Male | 2.67 | 0.49 – 14.45 | 0.2552 |
| Site | | | |
| *La Fondita de Jesús** | 1.00 | | |
| *Las Duchas* | 0.67 | 0.30 – 1.47 | 0.3157 |
| Age | | | |
| 21 – 40* | 1.00 | | |
| 41 - 60 | 1.00 | 0.42 – 2.39 | 0.4209 |
| 61 - 82 | 0.47 | 0.01 – 2.22 | 0.3059 |
| Education | | | |
| Less than high school | 0.77 | 0.31 – 1.90 | 0.3896 |
| Completed high school | 1.21 | 0.44 – 3.34 | 0.4914 |
| More than high school* | 1.00 | | |
| Welfare | | | |
| No | 0.71 | 0.32 – 1.60 | 0.4106 |
| Yes* | 1.00 | | |
| Odd jobs on the streets | | | |
| No* | 1.00 | | |
| Yes | 0.62 | 0.28 – 1.36 | 0.2309 |
| Salary | | | |
| No | 1.90 | 0.81 – 4.43 | 0.1389 |
| Yes* | 1.00 | | |

* Reference category
MCS reference category: above the median

On-the-streets and transitionally homeless individuals had almost 2 (95% CI: 0.68-3.56) fold greater odds of scoring a physical health status at or below the median than their housed counterparts (Table 4.20). Individuals who indicated living on the streets for more than seven years were 31% (95% CI: 0.18–2.68) less likely to score at or below the median in the PCS scale than those that lived less time (POR=1.62; 95% CI: 0.56–4.72). Homeless perception (POR=2.02; 95% CI: 0.88–4.65) was marginally associated with scoring a physical health status at or below the median. Living on the streets previously (POR=1.28; 95% CI: 0.32–5.07) and having lived more than once in the streets (POR=1.56; 95% CI: 0.68–3.59) also increased the odds of scoring at or below the median in the PCS scale; however, these associations were not statistically significant.

Table 4.20: POR estimation to assess the association of homeless chronicity and a SF-36 physical health score (PCS) at or below the median.

| | $POR_{unadjusted}$ | 95% CI | P-value |
|---|---|---|---|
| Residential status | | | |
| Housed* | 1.00 | | |
| On-the-streets and transitionally homeless | 1.56 | 0.68 – 3.56 | 0.2958 |
| Self-perception of homelessness | | | |
| No* | 1.00 | | |
| Yes | 2.02 | 0.88 – 4.65 | 0.0977 |
| Have lived on the streets previously | | | |
| No* | 1.00 | | |
| Yes | 1.28 | 0.32 – 5.07 | 0.7273 |
| Number of times lived on the streets | | | |
| Once* | 1.00 | | |
| More than once | 1.56 | 0.68 – 3.59 | 0.2928 |
| Longest time lived on the streets | | | |
| ≤ 3 years* | 1.00 | | |
| 4 - 6 years | 1.62 | 0.56 – 4.72 | 0.2596 |
| ≥ 7 years | 0.69 | 0.18 – 2.68 | 0.3797 |

* Reference category
MCS reference category: above the median

Participants who indicated having HIV were almost 8 times (95% CI: 0.92–66.1) more likely to have a physical health status at or below the median than participants who did not have HIV (Table 4.21). Those with an anxiety disorder diagnosis were 2.5 (95% CI: 1.04–6.00) times more likely to have a lower PCS score than those without an anxiety disorder diagnosis. Having hepatitis C (POR=1.69; 95% CI: 0.60–4.80) and depression (POR=1.34; 95% CI: 0.60–2.97) also increased the odds of scoring a low physical health status score, although these were not statistically significant.

Table 4.21: POR estimation to assess the association of self-reported diagnosed medical conditions and a SF-36 physical health score (PCS) at or below the median.

| | $POR_{unadjusted}$ | 95% CI | P-value |
|---|---|---|---|
| HIV / AIDS | | | |
| No* | 1.00 | | |
| Yes | 7.81 | 0.92 – 66.10 | 0.0592 |
| Hepatitis C | | | |
| No* | 1.00 | | |
| Yes | 1.69 | 0.60 – 4.80 | 0.3229 |
| Depression | | | |
| No* | 1.00 | | |
| Yes | 1.34 | 0.60 – 2.97 | 0.4724 |
| Anxiety disorder | | | |
| No* | 1.00 | | |
| Yes | 2.50 | 1.04 – 6.00 | 0.0400 |

* Reference category
MCS reference category: above the median

Those participants that disclosed receiving drug or alcohol rehabilitation treatment in the past had 1.63 (95% CI: 0.74–3.59) greater odds of achieving a PCS score at or below the median than participants who did not receive such treatment (Table 4.22). Being unable to access health care services increased the odds of scoring a low physical health status score compared to those who could access health care services (POR=2.02; 95% CI: 0.88–4.65). Receiving health care at an outpatient facility (POR=0.39; 95% CI: 0.12 – 1.28), ER (POR=0.39; 95% CI: 0.11 – 1.43) or CBO (POR=0.91; 95% CI: 0.12 – 6.72) decreased the odds of scoring at or below the median in the PCS scale, compared to those who sought services at a private physician's office; however, these differences were not statistically significant.

Table 4.22: POR estimation to assess the association of access to health care factors and a SF-36 physical health score (PCS) at or below the median.

| | $POR_{unadjusted}$ | 95% CI | P-value |
|---|---|---|---|
| Received drug or alcohol treatment | | | |
| No* | 1.00 | | |
| Yes | 1.63 | 0.74 – 3.59 | 0.2298 |
| Last medical visit | | | |
| Less than a year ago* | 1.00 | | |
| More than one year ago | 0.62 | 0.18 – 2.11 | 0.4429 |
| Unable to access health care services | | | |
| No* | 1.00 | | |
| Yes | 2.02 | 0.88 – 4.65 | 0.0977 |
| Usual source of health care | | | |
| Physician's office* | 1.00 | | |
| Outpatient department | 0.39 | 0.12 – 1.28 | 0.1866 |
| ER | 0.39 | 0.11 – 1.43 | 0.2621 |
| CBO | 0.91 | 0.12 – 6.72 | 0.5526 |

* Reference category
MCS reference category: above the median

Drug users had almost two-fold (POR=1.63; 95% CI: 0.74-3.59) greater odds of scoring a physical health score at or below the median than non-drug users (Table 4.23). Polydrug users were 2.10 (95% CI: 0.85-5.19) times more likely to achieve a lower PCS score than users of one drug or less. Individuals who were inhaled heroine users (POR=2.92; 95% CI: 0.79 – 10.88) and speedball users (POR=3.03; 95% CI: 0.70 – 13.22) had the greatest odds of scoring below the median in the PCS scale. Nonetheless, these associations were not statistically significant.

Table 4.23: POR estimation to assess the association of drug use and a SF-36 physical health score (PCS) at or below the median.

| | $POR_{unadjusted}$ | 95% CI | P-value |
|---|---|---|---|
| Drug users | | | |
| No* | 1.00 | | |
| Yes | 1.63 | 0.74 – 3.59 | 0.2298 |
| Polydrug use | | | |
| None* | 1.00 | | |
| One drug | 1.06 | 0.37 – 3.06 | 0.5405 |
| Two or more drugs | 2.10 | 0.85 – 5.19 | 0.1093 |
| Type of drugs used** | | | |
| Marijuana | 1.39 | 0.56 – 3.46 | 0.4835 |
| Crack | 2.08 | 0.78 – 5.55 | 0.1438 |
| Cocaine | 1.79 | 0.61 – 5.27 | 0.2924 |
| Heroine | 2.92 | 0.79 – 10.88 | 0.1095 |
| Speedball | 3.03 | 0.70 – 13.22 | 0.1399 |
| Analgesics / sedatives | 1.56 | 0.42 – 5.85 | 0.5098 |

* Reference category
** Reference category: non-drug users
MCS reference category: above the median

## 4.3 Multivariate Analysis

### 4.3.1 Adjusted prevalence odds ratios for mental health status

The unadjusted prevalence odds ratio showed that on-the-street and transitionally homeless had almost 3 times (95% CI: 1.22-6.77) greater odds of scoring a mental health status at or below the median than their housed counterparts (Table 4.24). After adjusting for interviewing site as random intercept and polydrug use, on-the-street and transitionally homeless individuals were 2.57 (95% CI: 1.07-6.17) times more likely to score at or below the median in the MCS scale than housed individuals. This excess in the odds of scoring a poor mental health status was statistically significant (p=0.04).

Table 4.24: Adjusted POR estimation to assess the association of SF-36 mental health score (MCS) at or below the median and residential status.

| | Unadjusted† | | | Adjusted‡ | | |
|---|---|---|---|---|---|---|
| | POR | 95% CI | P-value | POR | 95% CI | P-value |
| Housed* | 1.00 | | | 1.00 | | |
| On-the-street and transitionally homeless | 2.88 | 1.22 – 6.77 | 0.02 | 2.57 | 1.07 – 6.17 | 0.04 |

† POR controlling for interviewing site as random intercept
‡ Adjusted for polydrug use and interviewing site (random intercept)
* Reference category
MCS reference category: above the median

### 4.3.2 Adjusted prevalence odds ratios for physical health status

The unadjusted prevalence odds ratio showed that on-the-street and transitionally homeless were 58% (95% CI: 0.56-4.43) more likely to score a physical health status at or below the median, compared to their housed counterparts (Table 4.25). After adjusting for interviewing site as random intercept, HIV and anxiety disorder, on-the-street and transitionally homeless individuals were 27% (95% CI: 0.52-3.11) more likely to score at or below the median in the PCS scale than housed individuals. However, this excess in the odds of scoring a poor physical health status was not statistically significant (p=0.60).

Table 4.25: Adjusted POR estimation to assess the association of SF-36 physical health score (PCS) at or below the median and residential status.

| | Unadjusted† | | | Adjusted‡ | | |
|---|---|---|---|---|---|---|
| | POR | 95% CI | P-value | POR | 95% CI | P-value |
| Housed* | 1.00 | | | 1.00 | | |
| On-the-street and transitionally homeless | 1.58 | 0.56 – 4.43 | 0.39 | 1.27 | 0.52 – 3.11 | 0.60 |

† POR controlling for interviewing site as random intercept
‡ Adjusted for HIV, anxiety disorder and interviewing site (random intercept)
* Reference category
PCS reference category: above the median

# Chapter 5: Conclusions

This chapter discusses the study results and their implications. In addition, it includes the conclusions and the limitations of the study.

## 5.1 Discussion

The results presented in this study highlight several important aspects of homeless populations seeking services at two community-based organizations in San Juan, Puerto Rico. The distribution of the residential status among study participants was as followed: 56.0% on-the-street homeless, 9.0% transitionally housed and 35.0% housed. The high prevalence of depression (44.4%) and anxiety disorder (32.3%) is consistent with previous studies among homeless populations (Reyes et al., 2005; Marrero et al., 2005; Kertesz et al., 2005; Riley et al., 2003; Riley et al., 2003; Smith and Larson, 2003). It has also been demonstrated that depression is more frequently reported by on-the-street homeless and transitionally housed (Reyes et al., 2005); indisputably, depression greatly impact the health related quality of life (Riley et al., 2003; Riley et al., 2003; Smith and Larson, 2003). Anxiety disorder is also a fundamental aspect of a healthy mental status among homeless individuals. However, it is not included in most studies of homeless populations as part of a comprehensive mental health evaluation (Reyes et al., 2005; Matos et al., 2004). HIV has also been a consistent documented factor affecting homeless populations. Although the prevalence of self-reported HIV (7.7%) was lower than what has been reported previously for HIV serostatus among homeless in PR (27.6% by Reyes

et al., 2005), it had a marginal association with a poor physical health status among study participants (p=0.06).

While a significant amount of respondents in the study were drug users (54.0%), a more important issue was at hand: polydrug use. Of those who disclosed their drug use, 63% were polydrug users. The most common simultaneous combination of drugs (10%) was the injected mix of cocaine and heroine (speedball). This data reinforces other study findings about the dangerous consequences of multiple drug use (Stevens at al., 2007; Nyamathi et al., 2007; De P et al., 2007; Stevens et al., 2007; Williamson et al., 2006; Griffiths & Weerts, 1997). It interferes with adherence to drug treatment (Marrero et al., 2005), sensitization to the use of other drugs (Finlinson et al., 2006), increases the expected frequency of drug injections (Colón et al., 2001), enhances toxicity (Usdan et al., 2001), and requires specialized detoxification treatment (Usdan et al., 2001). The fact that speedball's route of administration is usually intravenously, the risk of multiple conditions are increased including like HIV, hepatitis C, hepatitis B and ulcerations (Pérez et al., 2007; Marrero et al., 2005, Pérez et al., 2005; Finlinson et al., 2006). The use of *Xylazine* as an emergent drug of use among study participants could not be overlooked. The majority of speedball users (60%) reported using it together with analgesics and sedatives. There is an increasing need in Puerto Rico to study carefully new trends in drug use, because consumption is turning towards less restricted products. The issue of animal tranquilizers like *Xylazine* as drug adulterants was recently studied by three research groups in San Juan, PR (Rodríguez et al., 2008; Reyes et al., 2009; Ruiz et al., 2009). Rodríguez et al. (2008) found that 37.6% of the collected syringes in needle exchange programs had *Xylazine* and was frequently co-used with speedball (90.6%).

Reyes and colleagues (2009) also concurred that *Xylazine* was being used by a large percentage (74%) of drug users recruited in their study, and 56% reported using it in a mixture with speedball. Ruiz et al. (2009) documented the presence of *Xylazine* as a cutting agent in 36% of the samples confiscated on the streets in PR. They emphasized the importance of detecting this drug in whole blood samples and highlighted a possible link with the death of nine cases.

Study participants had lower mean MCS (42.2±14.4) and PCS (49.6±11.8) scores than the US population (Ware, 2000). As hypothesized, on-the-street and transitionally homeless scored lower on the physical and mental health status scales than housed individuals. This parallels other findings that indicate how homeless, marginally housed, HIV/HCV patients and drug users individuals consistently score lower in the SF-36 physical and mental health scales (Tsui et al., 2007; Kertesz et al., 2005; Riley et al., 2003; Riley et al., 2003; Smith & Larson, 2003). Transitionally housed had the lowest MCS mean score (32.6±16.6) and on-the-street homeless the lowest PCS mean score (48.0±12.6). On-the-street homeless scored the lowest in the following sub-scales: Physical Functioning, Role-Physical and General Health. Transitionally housed individuals scored the lowest in the following sub-scales: Bodily Pain, Vitality, Social Functioning, Role-Emotional, and Mental Health. Simple logistic regression analyses in our sample showed that residential status was significantly associated with the SF-36 mental health summary score, but not with the SF-36 physical health summary score. Although this was an unexpected finding, other studies have found similar results (Kertesz et al., 2005; Riley et al., 2003).

Multiple logistic regression models emphasized the importance of the mental health well-being in this population. After adjusting for polydrug use, on-the-street and transitionally homeless individuals were 2.57 (95% CI: 1.07-6.17) more likely to score at or below the median in the MCS scale than housed individuals. Kertesz et al. (2005) found that after adjusting for drug use, homeless individuals obtained poorer MCS scores than other groups over a two-year period. In contrast, our study showed that after adjusting for self-reported HIV and anxiety disorder, on-the-street and transitionally homeless individuals were 1.27 (95% CI: 0.52-3.11) times more likely to score at or below the median in the PCS scale than housed individuals; however, this result was not statistically significant. Other research group investigated the impact of HIV/HCV co-infections in the health related quality of life as measured by the SF-36 and concluded that these variables were only associated to their PCS domain (Tsui et al., 2007).

It is speculated that discrepancies in the results can be attributed to differences in our sample characteristics. Variables of importance like age, health insurance and access to health care services were not statistically associated with residential status or the SF-36 scores. One possible explanation is that our sample was recruited from community-based organizations that address these needs among their participants. They also offer many other integrated services that contribute to the physical and spiritual well-being of this population. It is of pertinence to mention that both interviewing sites were near of a health care facility that offered specialized services for homeless individuals (*Centro de Diagnóstico y Tratamiento - CDT)*. This influenced the fact that all individuals who reported that their usual source of health care was the outpatient department also mentioned seeking the service at the mentioned facility.

## 5.2 Conclusions

The results presented in this study support the hypothesis that the mental health status among on-the-street and transitionally homeless was worst than the mental health status of housed individuals. Although on-the-street and transitionally homeless were 27% more likely to have a poor physical health than their housed counterparts, this result was not statistically significant.

A need for greater access to health services was documented for programs specialized in homeless health care. Nearly half (48.0%) of the sampled subjects reported seeking health care services at the only *CDT* in San Juan that specializes in homeless health care. Unfortunately, the only place where this population relies for their health care is not sufficiently equipped to meet the continuous traumas faced by this population.

Consistent with previous studies, a high prevalence of mental health diseases and substance abuse was observed. Despite those findings, the mental health care system and the drug rehabilitation centers in San Juan are constantly struggling to meet the high demand of people seeking these services.

This work will hopefully help set research priorities, contribute for better public health planning and evaluation, and guide innovative interventions. The homeless populations are in need of more aggressive public policies and comprehensive prevention treatments.

## 5.3 Study limitations

Given the limitations of the study design, the presence of an association does not necessarily indicate a causal link because the temporal sequence of events cannot be determined. An additional limitation of cross-sectional studies is that individuals with periods of drug exacerbations or remissions may be falsely classified as not having the exposure of interest.

The sampling technique and sample size limit the authors' ability to generalize their findings to the homeless population of San Juan, Puerto Rico. Possible sources of bias introduced in the study were selection and information bias. The potential for selection bias could not be evaluated since we were unable to collect information on non-participants; however, we believe that differences between participants and non-participants on variables of interest are minimal. Information bias, specifically recall bias, was also an issue because of the required need in remembering past events and experiences that individuals on the street could have remembered better due to their current circumstances.

The SF-36 health survey has its own limitations. Some SF-36 scales have been shown to have 10-20% less precision than the long-form of this questionnaire (Ware et al., 1996). Ceiling and floor effects, especially for the original Version 1.0, are noteworthy limitations documented in the literature for some populations. These disadvantages of the SF-36 should be weighed against the fact that many alternative questionnaires require more time to complete and burden the respondents. Because the SF-36 version is less precise than its original longer version (MOS), it can lead to a reduction in the statistical power of hypothesis testing.

## 5.4 Recommendations

The prevalence of self-reported psychiatric conditions and substance use was considerable; however, additional studies should incorporate diagnostic tools as a strategy to document the burden of these conditions in the homeless population. The increasing need for more specialized programs tailored to the needs of people experiencing homelessness in San Juan is tremendously needed. Consistent with the recommendations of the National Health Care for the Homeless Council (2009), expanding and strengthening the health care programs that respond to and prevent homelessness in San Juan will minimize its impact on their communities.

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## Appendices

**Appendix A:** UPR-MSC IRB approval letter

UNIVERSIDAD DE PUERTO RICO, RECINTO DE CIENCIAS MÉDICAS
UNIVERSITY OF PUERTO RICO, MEDICAL SCIENCES CAMPUS

OFICINA DEL RECTOR
OFFICE OF THE CHANCELLOR

COMITÉ DE DERECHOS HUMANOS (IRB)
INSTITUTIONAL REVIEW BOARD

**Date:** June 2, 2008

**Protocol Number:** A6180108

**Principal Investigator:** Sheyla Garced Tirado

**Department / Division:** School of Public Health

**Sponsor:**

**Title:** ***Association between physical incapacity and residential status among individuals attending institutions that offer services for the homeless in San Juan, Puerto Rico.***

Thank you for your response to requests from a prior review of your application. This type of response qualifies for expedite review under FDA and OHRP regulations. This is to confirm that your application is now fully approved.

This action involves:

- ☒ New proposal/project
- ☐ Waiver of Consents
- ☐ Continuing Review of Previously Approved Protocol
- ☐ Protocol Amendment
- ☐ Amendment
- ☐ Adverse Events
- ☐ Serious Adverse Events

The following documents were reviewed under this submission:

- ☒ Protocol
- ☐ Assent Document
- ☐ Informed Consent Document
- ☐ Letter of Amendment
- ☒ Survey Instrument
- ☐ Package Insert
- ☐ Advertisement
- ☒ Human Subject Certified
- ☐ Investigator Brochure
- ☐ Authorization Letter
- ☐ Informative Sheet
- ☒ Curriculum Vitae
- ☒ HIPAA Certified
- ☐ FDA #1572
- ☐ Others:

In compliance with federal regulations the approval for this study is valid through:**May 14, 2009**.

Cordially,

Alan Preston, PhD
Chairperson IRB 1

rnco

1. Research must be conducted according to the proposal that was approved by the IRB.
2. Changes to the protocol or its related consent document must be approved by the IRB prior to implementation.
3. All serious or unexpected adverse events/drug reactions should be reported.
4. Each subject should receive a copy of the consent document, if appropriate.
5. Records must be retained for at least three years.
6. Any future correspondence should include the IRB identification number provided and the study title.

**Appendix B:** Informed consent

**Universidad de Puerto Rico**
**Recinto de Ciencias Médicas**
**Escuela Graduada de Salud Pública**
**Hoja de consentimiento informado para participar en estudio de investigación**

**Título**
*Asociación entre incapacidad física y estatus residencial en individuos que asisten a instituciones que ofrecen servicios a personas sin hogar en San Juan, Puerto Rico.*

**Número de Protocolo:** A6180108

**Investigadores:**
Sheyla Garced Tirado, BS; Escuela Graduada de Salud Pública (Investigadora Principal)
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**Introducción**
Usted ha sido seleccionado para participar en un estudio de investigación realizado por la Escuela Graduada de Salud Pública del Recinto de Ciencias Médicas como parte de un proyecto de tesis de maestría. La investigación se titula *Asociación entre incapacidad física y estatus residencial en individuos que asisten a instituciones que ofrecen servicios a personas sin hogar en San Juan, Puerto Rico.* Como parte del estudio se reclutarán 100 adultos mayores de 21 años, participantes de algún programa que ofrezca servicios a personas sin hogar en el área de San Juan. Se estima que la duración del estudio es un año. En este documento se describe la información relacionada a este estudio. El personal del estudio discutirá con usted esta información y si tiene preguntas sobre el estudio las puede hacer en cualquier momento. Si decide participar en el estudio, se le pedirá que firme este formulario de consentimiento y se le entregará una copia del mismo.

**Propósito**
El riesgo de desarrollar incapacidad física en personas sin hogar es un asunto importante de salud pública que amerita ser estudiado. Limitaciones en el funcionamiento o restricción en las actividades diarias que un individuo pueda padecer, dificultan el desempeño y hasta la accesibilidad a servicios de salud. Factores que puedan predisponer a desarrollar más fácilmente alguna incapacidad física no han sido estudiados en la población puertorriqueña de personas sin hogar. Este estudio propone investigar como el estatus residencial puede estar relacionado a desarrollar alguna incapacidad física. Además estimará el porcentaje de adultos que padecen de incapacidad física y describirá las características asociadas. Su participación en este estudio puede

contribuir a desarrollar medidas de prevención que disminuyan el desarrollo de incapacidad física en nuestra población.

**Procedimientos**
Si usted decide participar, un entrevistador le hará una entrevista personal que consistirá de un cuestionario con preguntas sobre su información sociodemográfica, historial médico, incapacidad física y uso de drogas. Una vez terminada la entrevista, el cuestionario será sellado en un sobre hasta la entrada de datos y solo será identificado con un código personal. La entrevista se llevará a cabo con privacidad y la información que nos brinde será confidencial y sólo para propósitos de este estudio. El tiempo estimado para completar el cuestionario es una hora.

**Beneficios**
Como resultado de su participación en este estudio no recibirá ningún beneficio directo.

**Riesgos y Molestias**
La participación en este estudio requiere completar un cuestionario con información personal. El cuestionario puede incluir preguntas sensitivas e incomodidad por el tiempo de duración que requiere la entrevista. Usted tiene el derecho de no contestar aquellas preguntas que le incomoden o dejar de participar en cualquier momento sin ninguna penalidad. Le garantizamos que la información que usted nos provea será utilizada solamente para los propósitos de esta investigación y será guardada con confidencialidad. Únicamente, los investigadores de este estudio podrán tener acceso a la información recopilada en los cuestionarios.

**Privacidad y Confidencialidad**
La Ley de Responsabilidad y Portabilidad de Seguro Médico (HIPAA, por sus siglas en inglés) establece una norma sobre privacidad destinada a proteger la confidencialidad de la información sobre su salud. Bajo dicha norma, toda la información personal que usted nos provea será mantenida bajo estricta confidencialidad. Los identificadores personales se utilizarán exclusivamente para reclutar a los participantes. Este documento será guardado bajo llave, separado del cuestionario para que no se pueda vincular la información que nos provea. Los resultados de este estudio se presentarán de forma resumida en tablas y gráficas y su nombre o cualquier otra información que lo identifique no serán utilizados durante el análisis de los datos, los informes ni las publicaciones. Toda su información será utilizada exclusivamente por los investigadores del estudio y podrían ser examinadas por las autoridades pertinentes del Recinto de Ciencias Médicas.

**Costos e Incentivos al Participante**
No habrá ningún costo asociado por participar en este estudio. Tampoco se le pagará por participar.

**Compensación en caso de daño**
En caso de sufrir algún daño físico o mental como resultado de su participación voluntaria en este estudio, usted tendrá el derecho a recibir tratamiento médico sin costo alguno en el Hospital Universitario o en cualquier otro hospital que designe el Rector del Recinto de Ciencias Médicas de la Universidad de Puerto Rico. Sin embargo, no recibirá ninguna compensación económica.

**Participación Voluntaria**
Su participación en este estudio es completamente voluntaria. Usted tiene el derecho de rehusar a participar o descontinuar su participación en el estudio en cualquier momento sin penalidad o pérdida de beneficio.

**Persona Contacto**
En caso de que surjan preguntas sobre el estudio o posibles lesiones asociadas a la investigación, usted se puede comunicar con Sheyla Garced Tirado, Investigadora Principal al 787-473-2678 ó al 787-758-2525 a las extensiones 1400, 1427 y 1428. Si desea una consulta en relación a sus derechos como sujeto de estudio, usted podrá comunicarse a la Oficina para la Protección de Participantes Humanos en Investigación del Recinto de Ciencias Médicas de la Universidad de Puerto Rico al 787-282-0010 ó 787-282-0018.

**Consentimiento**
Su firma en este documento certifica que usted ha leído (o le han leído) el documento, que usted entiende la naturaleza de su participación, las implicaciones del estudio y que usted acepta voluntariamente participar en el mismo. Usted recibirá copia del consentimiento informado firmado y con el sello de aprobación de la Oficina para la Protección de Participantes Humanos en Investigación en cada página.

_____
Nombre (en letra de molde) del Participante

_____ _____
Firma del Participante Fecha

_____
Nombre (en letra de molde) del Investigador

_____ _____
Firma del Investigador Fecha

**Appendix C:** Questionnaire

Universidad de Puerto Rico
Recinto de Ciencias Médicas
Escuela Graduada de Salud Pública
Departamento de Bioestadística y Epidemiología

Proyecto de tesis:

# *Asociación entre incapacidad física y estatus residencial en individuos que asisten a instituciones que ofrecen servicios a personas sin hogar en San Juan, Puerto Rico.*

Investigadora Principal:

Sheyla Garced Tirado

Comité de tesis:

Cynthia M. Pérez, PhD

Erick Suárez, PhD

Juan Carlos Reyes, EdD

*Asociación entre incapacidad física y estatus residencial en individuos que asisten a instituciones que ofrecen servicios a personas sin hogar en San Juan, Puerto Rico*

---

**Identificación del Participante:** _____ _____ _____ _____
Lugar Sujeto

**Fecha de la entrevista:** _____ _____ / _____ _____ / _____ _____ _____ _____
Día Mes Año

**Iniciales del entrevistador:** _____ _____ _____

**Tabla de Contenido**

## Sección A: Información Sociodemográfica

**"Vamos a comenzar con la entrevista. A continuación le haré algunas preguntas generales sobre usted. Para cada pregunta indique la respuesta correspondiente."**

A1. **Entrevistador –** codifique el sexo del participante:

____ 1 Femenino ____ 2 Masculino

A2. ¿Podría decirme cuántos años tiene?

____ ____ años ____ No sabe ____ Rehúsa

A3. ¿Cuál es el nivel de educación más alto que usted ha completado?

**[1=Primer Grado, 12=cuarto año, 13=Asistió a universidad pero nunca se graduó,**

**14=Grado Asociado, 15=Bachillerato, 16=Maestría, 17=Doctorado]**.

_____

88- No sabe 99- Rehúsa

A4. En los pasados 12 meses, ¿ha conseguido dinero o ingresos de…? **[Marque todas las que apliquen]**

____ 1 Sueldo o salario de un trabajo o negocio

____ 2 Asistencia económica, "welfare" o cupones

____ 3 Seguro social, incapacidad, Fondo del Seguro del Estado

____ 4 Desempleo

____ 5 Esposo(a), miembro de su familia o amigo(a)

____ 6 Auto-empleo, micro-empresa

____ 7 Pensión alimentaria o sustento a menores

____ 8 Actividad ilegal o posiblemente ilegal (robar, venta de drogas y prostitución)

____ 9 Cualquier otra fuente [Especifique] _____

A5. ¿Se considera usted deambulante?

____ 1 Sí

____ 2 No

____ 8 No sabe

____ 9 Rehúsa

A6. ¿Dónde usted vive actualmente?

____ 1 En la casa o apartamento de un familiar o amigo

____ 2 En la calle o albergue

____ 3 Casa o apartamento propio o alquilado

____ 4 Otro **[Especifique]** _____

____ 8 No sabe

____ 9 Rehúsa

A6a. ¿Cuánto tiempo lleva viviendo en esas condiciones?

____ ____ días ____ ____ meses ____ ____ años

88 / 88 / 88 – No sabe 99 / 99 / 99 - Rehúsa

A7. ¿En algún momento de su vida ha vivido en la calle, edificios abandonados, puentes, parques o aceras?

____ 1 Sí [Especifique número de veces] ____ ____ 88- No sabe 99- Rehúsa

____ 2 No **[Si contesta "No" pase a la Sección B]**

____ 8 No sabe

____ 9 Rehúsa

A7a. ¿Cuál ha sido el periodo más largo en que ha estado viviendo en la calle, edificios abandonados, puentes, parques o aceras?

____ ____ días ____ ____ meses ____ ____ años

88 / 88 / 88 – No sabe 99 / 99 / 99 - Rehúsa

**Sección B: Historial Médico**

**"Ahora le haré unas preguntas sobre algunas condiciones de salud que haya padecido en algún momento de su vida. Recuerde que esta información es confidencial."**

**[Entrevistador] Codifique Sí = 1, No = 2, No sabe = 8 ó Rehúsa = 9 para cada pregunta.**

*** [Entrevistador] Pregunte si el individuo ha sufrido de algún accidente, golpe o paliza que le haya causado trauma físico como fractura.**

| | B1. | B2. | B3. | B4. | B5. | B6. | B7. |
|---|---|---|---|---|---|---|---|
| | VIH o SIDA | Hepatitis C | Hepatitis B | Tuberculosis | Depresión | Ansiedad | Trauma Físico* |
| a. ¿Alguna vez un médico le ha dicho que usted tiene/ o ha padecido de…? | | | | | | | |
| b. ¿Qué edad tenía usted la primera vez que le diagnosticaron / o padeció de…? | ___ ___ años | ___ ___ años | ___ ___ años | ___ ___ años | ___ ___ años | ___ ___ años | ___ ___ años |
| c. ¿Recibió tratamiento médico para…? | | | | | | | |
| d. ¿Le dijo el médico que se había curado o recuperado de…? | | | | | | | |

**"Ahora le haré unas preguntas relacionadas al uso y acceso a servicios de salud en algún momento de su vida y en los pasados 12 meses."**

B8. En algún momento de su vida, ¿ha recibido servicios de tratamiento o rehabilitación por el uso de drogas o alcohol?

____ 1 Sí

____ 2 No

____ 8 No sabe

____ 9 Rehúsa

B9. ¿Cuándo fue la última vez que recibió cualquier atención médica?

____ ____ / ____ ____ ____ ____
mes año

88 / 8888 - No sabe 99 / 9999 – Rehúsa

B10. ¿En los últimos 12 meses quiso alguna vez visitar a un profesional de la salud (médico primario o especialista) pero no pudo hacerlo?

____ 1 Sí

____ 2 No **[Si contesta "No" pase a la pregunta B11]**

____ 8 No sabe

____ 9 Rehúsa

B10a. ¿Cuál fue la razón principal por la que no pudo atenderse con un profesional de la salud?
**[Marque todas las que apliquen]**

____ 1 No tenía tiempo

____ 2 No tenía dinero o seguro médico

____ 3 No tenía transportación

____ 4 No quisieron atenderme

____ 5 No quedaba en un lugar conveniente

____ 6 Otra [Especifique] _____

____ 8 No sabe

____ 9 Rehúsa

B11. ¿Cuál es su fuente principal de atención médica?

____ 1 Oficina privada de médico

____ 2 Sala de emergencia

____ 3 Clínicas externas en un hospital

____ 4 Instituciones no-gubernamentales o sin fines de lucro

____ 5 Otro [Especifique] _____

____ 8 No sabe

____ 9 Rehúsa

B12. ¿Qué plan médico usted tiene?

____ 1 No tengo plan médico

____ 2 Público (Reforma (Cruz Azul-Reforma, Triple-C y MCS-Reforma); Seguro médico de Veteranos)

____ 3 Privado (Cruz Azul, Triple S, MCS y Maestros)

____ 8 No sabe

____ 9 Rehúsa

**"Las siguientes preguntas están relacionadas al uso de cigarrillo y alcohol."**

B13. ¿Alguna vez ha fumado cigarrillos, pipa o cigarros (tabaco)?

____ 1 Sí

____ 2 No **[Si contesta "No" pase a la pregunta B14]**

____ 8 No sabe

____ 9 Rehúsa

B13a. ¿Cuántos cigarrillos, cigarros o pipas fuma en promedio al día?

____ ____ cigarrillos ____ No sabe ____ Rehúsa

B14. ¿Alguna vez ha tomado alcohol? Ya sea una cerveza, una copa de vino, o un trago de ron, whiskey, vodka, o algún otro tipo de licor.

____ 1 Sí

____ 2 No **[Si contesta "No" pase a la Sección C]**

____ 8 No sabe

____ 9 Rehúsa

B14a. Durante los últimos 30 días, ¿con cuanta frecuencia ha tomado?

____ 1 Todos los días
____ 2 De 4 a 6 veces por semana
____ 3 De 1 a 3 veces por semana
____ 4 Varias veces al mes
____ 5 Menos de una vez al mes
____ 8 No sabe
____ 9 Rehúsa

**Sección C: Incapacidad Física (SF-36 versión 1.0)**

**"Las primeras preguntas tratan sobre su salud en el presente y sus actividades diarias actuales. Trate de responder a cada pregunta con la mayor precisión posible"**

C1. En términos generales, ¿diría que su salud es…?

____ 1 Excelente

____ 2 Muy buena

____ 3 Buena

____ 4 Regular

____ 5 Mala

C2. Comparando su estado de salud actual con su estado de salud hace un año, ¿Diría que es…?

____ 1 Mucho mejor ahora que hace un año

____ 2 Algo mejor ahora que hace un año

____ 3 Más o menos igual que hace un año

____ 4 Algo peor ahora que hace un año

____ 5 Mucho peor ahora que hace un año

**C3. "Ahora le voy a leer una lista de actividades que quizás usted haría durante un día típico. A medida que lea cada caso, por favor dígame si su salud ahora lo limita mucho, lo limita un poco, o no lo limita en absoluto en estas actividades."**

**[Nota: En cuanto a las preguntas 3a – 3i, si el entrevistado dice que no hace las actividades, investigue: ¿Es eso por su salud? Si el entrevistado no hace las actividades por razones de salud, circule '1' (Sí, me limita mucho). Si el entrevistado no hace las actividades por otras razones (no relacionadas con la salud), circule '3' (No, no me limita en absoluto)]**

C3a. Primero, actividades vigorosas tales como correr, levantar objetos pesados o participar en deportes intensos. ¿Su salud ahora lo limita mucho, lo limita un poco, o no lo limita en absoluto?
**[Si el entrevistado dice que no hace estas actividades, investigue: ¿Es eso por su salud?]**

____ 1 Sí, me limita mucho

____ 2 Sí, me limita un poco

____ 3 No, no me limita en absoluto

C3b. …actividades moderadas, tales como cambiar de sitio una mesa, empujar objetos medianamente pesados o jugar billar. ¿Su salud ahora lo limita mucho, lo limita un poco, o no lo limita en absoluto?
**[Si el entrevistado dice que no hace estas actividades, investigue: ¿Es eso por su salud?]**

____ 1 Sí, me limita mucho
____ 2 Sí, me limita un poco
____ 3 No, no me limita en absoluto

C3c. …levantar o llevar bolsas con artículos o alguna mochila. ¿Su salud ahora lo limita mucho, lo limita un poco, o no lo limita en absoluto?
**[Si el entrevistado dice que no hace estas actividades, investigue: ¿Es eso por su salud?]**

____ 1 Sí, me limita mucho
____ 2 Sí, me limita un poco
____ 3 No, no me limita en absoluto

C3d. …subir varios pisos de escalera. ¿Su salud ahora lo limita mucho, lo limita un poco, o no lo limita en absoluto?
**[Si el entrevistado dice que no hace estas actividades, investigue: ¿Es eso por su salud?]**

____ 1 Sí, me limita mucho
____ 2 Sí, me limita un poco
____ 3 No, no me limita en absoluto

C3e. …subir un piso de escalera. ¿Su salud ahora lo limita mucho, lo limita un poco, o no lo limita en absoluto?
**[Si el entrevistado dice que no hace estas actividades, investigue: ¿Es eso por su salud?]**

____ 1 Sí, me limita mucho
____ 2 Sí, me limita un poco
____ 3 No, no me limita en absoluto

C3f. …doblarse, arrodillarse o agacharse. ¿Su salud ahora lo limita mucho, lo limita un poco, o no lo limita en absoluto? **[Si el entrevistado dice que no hace estas actividades, investigue: ¿Es eso por su salud?]**

____ 1 Sí, me limita mucho
____ 2 Sí, me limita un poco
____ 3 No, no me limita en absoluto

C3g. …caminar más de una milla. ¿Su salud ahora lo limita mucho, lo limita un poco, o no lo limita en absoluto?
**[Si el entrevistado dice que no hace estas actividades, investigue: ¿Es eso por su salud?]**

____ 1 Sí, me limita mucho
____ 2 Sí, me limita un poco
____ 3 No, no me limita en absoluto

C3h. …caminar varias cuadras. ¿Su salud ahora lo limita mucho, lo limita un poco, o no lo limita en absoluto?
**[Si el entrevistado dice que no hace estas actividades, investigue: ¿Es eso por su salud?]**

____ 1 Sí, me limita mucho
____ 2 Sí, me limita un poco
____ 3 No, no me limita en absoluto

C3i. …caminar una cuadra. ¿Su salud ahora lo limita mucho, lo limita un poco, o no lo limita en absoluto?
**[Si el entrevistado dice que no hace estas actividades, investigue: ¿Es eso por su salud?]**

____ 1 Sí, me limita mucho
____ 2 Sí, me limita un poco
____ 3 No, no me limita en absoluto

C3j. ...bañarse o vestirse. ¿Su salud ahora lo limita mucho, lo limita un poco, o no lo limita en absoluto?
**[Si el entrevistado dice que no hace estas actividades, investigue: ¿Es eso por su salud?]**

____ 1 Sí, me limita mucho
____ 2 Sí, me limita un poco
____ 3 No, no me limita en absoluto

**C4. "Las siguientes cuatro preguntas tratan sobre su salud física y sus actividades diarias."**

| | Sí | No |
|---|---|---|
| C4a. Durante las últimas 4 semanas, ¿ha reducido el tiempo que dedicaba al trabajo u otras actividades diarias regulares a causa de su salud física? | ____ | ____ |
| C4b. Durante las últimas 4 semanas, ¿ha logrado menos de lo que le hubiera gustado a causa de su salud física? | ____ | ____ |
| C4c. Durante las últimas 4 semanas, ¿ha tenido limitaciones en cuanto al tipo de trabajo u otras actividades a causa de su salud física? | ____ | ____ |

| | Sí | No |
|---|---|---|
| C4d. Durante las últimas 4 semanas, ¿ha tenido dificultades en realizar el trabajo u otras actividades a causa de su salud física (por ejemplo, le ha tomado esfuerzo adicional)? | ____ | ____ |

**C5. "Las siguientes preguntas tratan sobre sus emociones y sus actividades diarias."**

| | Sí | No |
|---|---|---|
| C5a. Durante las últimas 4 semanas, ¿ha reducido el tiempo que dedicaba al trabajo u otras actividades a causa de cualquier problema emocional (como sentirse deprimido o angustiado)? | ____ | ____ |
| C5b. Durante las últimas 4 semanas, ¿ha logrado menos de lo que le hubiera gustado a causa de cualquier problema emocional (como sentirse deprimido o angustiado)? | ____ | ____ |
| C5c. Durante las últimas 4 semanas, ¿no ha hecho el trabajo u otras actividades con el cuidado de siempre a causa de cualquier problema emocional (como sentirse deprimido o angustiado)? | ____ | ____ |

C6. Durante las últimas 4 semanas, ¿en qué medida su salud física o sus problemas emocionales han dificultado sus actividades sociales normales con la familia, amigos, vecinos o grupos? ¿Han dificultado…?

____ 1 Nada en absoluto
____ 2 Ligeramente
____ 3 Medianamente
____ 4 Bastante
____ 5 Extremadamente

C7. Durante las últimas 4 semanas, ¿en qué medida el dolor ha dificultado su trabajo normal? ¿Ha dificultado…?

____ 1 Nada en absoluto
____ 2 Ligeramente
____ 3 Medianamente
____ 4 Bastante
____ 5 Extremadamente

C8. ¿Cuánto dolor del cuerpo ha tenido usted durante las últimas 4 semanas? ¿Ha tenido…?

____ 1 Ningún dolor

____ 2 Muy poco

____ 3 Poco

____ 4 Moderado

____ 5 Severo

____ 6 Muy severo

C9. Durante las últimas 4 semanas, ¿en qué parte del tiempo su salud física o sus problemas emocionales han dificultado sus actividades sociales (como visitar amigos, parientes, etc.)? ¿Ha dificultado…?

____ 1 Todo el tiempo

____ 2 La mayor parte del tiempo

____ 3 Parte del tiempo

____ 4 Una pequeña parte del tiempo

____ 5 En ningún momento

**C10. "Las próximas preguntas se refieren a cómo usted se siente y cómo le han ido las cosas durante las últimas cuatro semanas. A medida que lea cada pregunta, por favor déme la respuesta que más se acerca a la manera como se ha sentido usted; se ha sentido así todo el tiempo, la mayor parte del tiempo, gran parte del tiempo, parte del tiempo, una pequeña parte del tiempo, o en ningún momento."**

C10a. ¿Cuánto del tiempo en las últimas 4 semanas, se ha sentido lleno de vida?

____ 1 Todo el tiempo

____ 2 La mayor parte del tiempo

____ 3 Gran parte del tiempo

____ 4 Parte del tiempo

____ 5 Una pequeña parte del tiempo

____ 6 En ningún momento

C10b. ¿Cuánto del tiempo en las últimas 4 semanas, se ha sentido muy nervioso?

____ 1 Todo el tiempo

____ 2 La mayor parte del tiempo

____ 3 Gran parte del tiempo

____ 4 Parte del tiempo

____ 5 Una pequeña parte del tiempo

____ 6 En ningún momento

C10c. ¿Cuánto del tiempo en las últimas 4 semanas, se ha sentido tan decaído de ánimo que nada podía animarlo?

**[Lea las opciones únicamente si es necesario]**

____ 1 Todo el tiempo

____ 2 La mayor parte del tiempo

____ 3 Gran parte del tiempo

____ 4 Parte del tiempo

____ 5 Una pequeña parte del tiempo

____ 6 En ningún momento

C10d. ¿Cuánto del tiempo en las últimas 4 semanas, se ha sentido tranquilo y calmado?

**[Lea las opciones únicamente si es necesario]**

____ 1 Todo el tiempo

____ 2 La mayor parte del tiempo

____ 3 Gran parte del tiempo

____ 4 Parte del tiempo

____ 5 Una pequeña parte del tiempo

____ 6 En ningún momento

C10e. ¿Cuánto del tiempo en las últimas 4 semanas, ha tenido mucha energía?

**[Lea las opciones únicamente si es necesario]**

____ 1 Todo el tiempo

____ 2 La mayor parte del tiempo

____ 3 Gran parte del tiempo

____ 4 Parte del tiempo

____ 5 Una pequeña parte del tiempo

____ 6 En ningún momento

C10f. ¿Cuánto del tiempo en las últimas 4 semanas, se ha sentido desanimado y triste?

**[Lea las opciones únicamente si es necesario]**

____ 1 Todo el tiempo

____ 2 La mayor parte del tiempo

____ 3 Gran parte del tiempo

____ 4 Parte del tiempo

____ 5 Una pequeña parte del tiempo

____ 6 En ningún momento

C10g. ¿Cuánto del tiempo en las últimas 4 semanas, se ha sentido agotado?

**[Lea las opciones únicamente si es necesario]**

____ 1 Todo el tiempo

____ 2 La mayor parte del tiempo

____ 3 Gran parte del tiempo

____ 4 Parte del tiempo

____ 5 Una pequeña parte del tiempo

____ 6 En ningún momento

C10h. ¿Cuánto del tiempo en las últimas 4 semanas, ha sido una persona feliz?

**[Lea las opciones únicamente si es necesario]**

____ 1 Todo el tiempo

____ 2 La mayor parte del tiempo

____ 3 Gran parte del tiempo

____ 4 Parte del tiempo

____ 5 Una pequeña parte del tiempo

____ 6 En ningún momento

C10i. ¿Cuánto del tiempo en las últimas 4 semanas, se ha sentido cansado?

**[Lea las opciones únicamente si es necesario]**

____ 1 Todo el tiempo

____ 2 La mayor parte del tiempo

____ 3 Gran parte del tiempo

____ 4 Parte del tiempo

____ 5 Una pequeña parte del tiempo

____ 6 En ningún momento

**C11. "Ahora le voy a leer una lista de afirmaciones. De cada una, dígame si la considera completamente cierta, mayormente cierta, mayormente falsa o completamente falsa."**

C11a. Parece que yo me enfermo un poco más fácilmente que otra gente. ¿Diría que es…?

____ 1 Completamente cierto

____ 2 Mayormente cierto

____ 3 No sé

____ 4 Mayormente falso

____ 5 Completamente falso

C11b. Tengo tan buena salud como cualquiera que conozco. ¿Diría que es…?

____ 1 Completamente cierto

____ 2 Mayormente cierto

____ 3 No sé

____ 4 Mayormente falso

____ 5 Completamente falso

C11c. Creo que mi salud va a empeorar. ¿Diría que es…?

____ 1 Completamente cierto

____ 2 Mayormente cierto

____ 3 No sé

____ 4 Mayormente falso

____ 5 Completamente falso

C11d. Mi salud es excelente. ¿Diría que es…?

____ 1 Completamente cierto

____ 2 Mayormente cierto

____ 3 No sé

____ 4 Mayormente falso

____ 5 Completamente falso

## Sección D: Uso de drogas

**"Voy a hacerle unas preguntas sobre prácticas y uso de drogas <u>en los pasados 12 meses</u>. Cuando digo drogas me refiero a cualquier substancia adictiva, incluyendo marihuana, cocaína, crack, heroína, etc."**

| | D1. Marihuana | D2. Cocaína (inhalada) | D3. Cocaína (inyectada) | D4. Crack | D5. Heroína (inhalada) | D6. Heroína (inyectada) | D7. Heroína (fumada) | D8. Estimulantes (Anfetaminas) | D9. Analgésicos / Sedativos |
|---|---|---|---|---|---|---|---|---|---|
| **a. ¿Ha utilizado la droga en los pasados 12 meses?** | | | | | | | | | |
| **b. ¿Cuán a menudo ha utilizado la droga en los pasados 12 meses?*** | | | | | | | | | |
| **c. ¿Con qué otras drogas la ha utilizado en los pasados 12 meses?§** | | | | | | | | | |
| **d. ¿Desde que comenzó a utilizar la droga, ha tenido alguna sobredosis o ha quedado inconsciente?** | | | | | | | | | |

**[Entrevistador]** Codifique Sí = 1, No = 2, No sabe = 8, Rehúsa = 9 para cada pregunta.

* **[Entrevistador]** Codifique lo siguiente para pregunta:

b. ¿Cuán a menudo ha utilizado la droga?

1 Varias veces al día
2 Una vez al día
3 Varias veces a la semana
4 Una vez a la semana
5 Varias veces al mes
6 Una vez al mes

§ **[Entrevistador]** Otras drogas que mezcle, utilice a la vez o después de la misma. Escriba todas las que apliquen:

01 Alcohol
02 Tabaco, cigarrillos
03 Marihuana
04 Cocaína (no crack)
05 Crack
06 Heroína
07 Estimulantes
08 Analgésicos / Sedativos
09 Otra
10 Ninguna otra droga
88 No sabe
99 Rehúsa

**“Quiero agradecerle el tiempo que ha dedicado en participar en esta entrevista personal. Muchas gracias.”**

## Sección E: Comentarios y observaciones del entrevistador

Anote a continuación cualquier impresión o idea importante que tenga sobre la entrevista:

**Appendix D:** Posters

# Health status and risk behaviors of homeless people in San Juan, Puerto Rico

Sheyla Garced; Cynthia M. Pérez, Ph.D.; Juan C. Reyes, Ed.D.; Erick Suárez, Ph.D.

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## ABSTRACT

**Background:** Public health faces the tremendous challenge of homelessness, a situation likely to interconnect with problems like physical and mental health conditions, drug use and other negative health-related outcomes. This study aimed to describe the health status of individuals attending institutions that offer services for the homeless in San Juan, Puerto Rico (PR). **Methods:** We performed a cross-sectional survey of individuals aged 21-82 years enrolled in two community-based organizations (CBOs) that offer services for the homeless in San Juan. Face-to-face interviews collected information on socio-demographic characteristics, substance use, health status, and access to medical care. Summary measures were computed to describe the study group. **Results:** 100 adults with a mean age of 46.0±11.3 years participated in the study; of these, 93.0% were males, and 62.0% had completed high school. The distribution of the residential status was as follows: 56.0% on-the-street homeless, 9.0% transitionally housed and 35.0% housed. Nearly half (47%.0) reported fair or poor physical health. The most prevalent self-reported health conditions were depression (44.0%), anxiety disorder (32.0%) and HCV infection (18.0%). Among 54 drug users, 63% reported recent use of at least two drugs. Marijuana (57.4%), crack (48.1%) and cocaine (35.2%) were the most widely used substances. Access-to-care factors revealed that 54.0% received drug or alcohol treatment, 36.0% were unable to access health care services, and 23.0% were uninsured. **Conclusions:** Findings suggest that there is a need for greater access to health care and for more aggressive prevention and treatment programs targeting homeless adults in San Juan.

## BACKGROUND

Research studies have disclosed the particular needs of access to health care services, poor health perception, histories of hospitalization, chronic health conditions and mental illnesses of homeless populations. Homeless chronicity and substance dependence are tremendous obstacles to drug treatment adherence and effective integration to the community. Puerto Rico also suffers from the unsolved issue of homelessness, San Juan being shelter of almost 30% of all the population in the island. More epidemiologic data targeting the needs of homeless individuals are constantly at need for the planning of more effective interventions and innovative public policies.

## STUDY AIM

- Describe the population under study by their socio-demographical characteristics, health related factors, drug use practices and access to health care.

## METHODS

- **Study population**:
  Individuals were selected from two CBOs that offer services to homeless in San Juan, Puerto Rico. A convenience sample of 100 individuals was selected using the following criteria: (1) older than 21 years of age (2) currently participating at a program that offer services to homeless in San Juan and (3) cognitively able to provide informed consent. The interviewing sites were:

  ***La Fondita de Jesús***:
  - Type of institution: Non-profit, community and faith-based organization
  - Target population: Homeless individuals
  - Services: Permanent and transitory housing to homeless individuals with or without drug or alcohol dependence; employment, medical and social services

  ***Las Duchas***:
  - Type of institution: Non-profit, community and faith-based organization
  - Target population: Homeless individuals
  - Services: A place to shower, clean clothes, personal hygiene items and basic medical services

- **Study design**: Cross-sectional study
- **Data collection**: Face-to-face interviews collected information on socio-demographic characteristics, health status, access to medical care and drug use practices. Residential status was defined as transitionally housed (living with friends, family or others) and on-the-street homeless (the street or in a shelter).
- **Statistical analysis**: Descriptive statistics were used to describe the study group.

## RESULTS

Socio-demographic characteristics of study population

| | Overall (n = 100) | |
|---|---|---|
| | n | % |
| CBO | | |
| *La Fondita de Jesús* | 55 | 55.0 |
| *Las Duchas* | 45 | 45.0 |
| Main source of income* | | |
| Welfare | 62 | 62.0 |
| Odd jobs on the streets | 52 | 52.0 |
| Salary | 33 | 33.0 |
| Social security or incapacity | 11 | 11.0 |
| Unemployment | 3 | 3.0 |

* Categories were not mutually exclusive

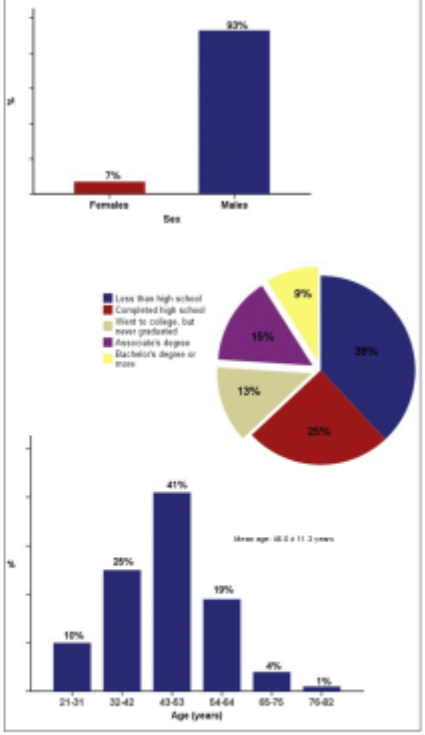


Table 1: Access to medical care and health status of study population

| | Overall (n = 100) | |
|---|---|---|
| | n | % |
| Received drug or alcohol treatment | 54 | 54.0 |
| Unable to access health care services | 36 | 36.0 |
| Usual source of health care | | |
| Physician's office | 16 | 16.0 |
| ER | 28 | 28.0 |
| Outpatient department* | 48 | 48.0 |
| CBO | 6 | 6.0 |
| Health insurance | | |
| None | 23 | 23.0 |
| Public | 73 | 73.0 |
| Private | 4 | 4.0 |
| Self-reported health conditions | | |
| Depression | 44 | 44.0 |
| Anxiety Disorder | 32 | 32.0 |
| Hepatitis C | 18 | 18.0 |
| HIV / AIDS | 8 | 8.0 |
| Perception of health | | |
| Excellent/Good | 53 | 53.0 |
| Fair/Poor | 47 | 47.0 |
| Current smokers | 72 | 72.0 |
| Current alcohol drinkers | 54 | 54.0 |

* Or a health care facility that offers specialized health care for homeless in San Juan.

Table 3: History of drug use in the past 12 months by study population

| | Overall (n = 100) | |
|---|---|---|
| | n | % |
| Drug users | 54 | 54.0 |
| Polydrug users* | 34 | 63.0 |
| Number of drugs used (mean±SD) | 2.3±1.3 | |
| Types of drugs used** | | |
| Marihuana | 31 | 57.4 |
| Crack | 26 | 48.1 |
| Cocaine† | 19 | 35.2 |
| Heroine† | 13 | 24.1 |
| Analgesics / sedatives | 11 | 20.4 |
| Speedball‡ | 10 | 18.5 |

* Users of two or more type of drugs
SD: Standard Deviation
** Categories were not mutually exclusive
† Inhaled or smoked crack.
‡ Injected mix of cocaine and heroine.

Table 2: Residential status and homeless chronicity of study population

| | Overall (n = 100) | |
|---|---|---|
| | n | % |
| Residential status | | |
| On-the-street homeless | 56 | 56.0 |
| Transitionally housed | 9 | 9.0 |
| Housed | 35 | 35.0 |
| Self-perception of homelessness | | |
| Yes | 64 | 64.0 |
| No | 36 | 36.0 |
| Have lived on the streets previously | | |
| Yes | 91 | 91.0 |
| No | 9 | 9.0 |
| Longest time lived on the streets (years) | | |
| ≤ 3 | 63 | 69.2 |
| 4 - 6 | 18 | 19.8 |
| ≥ 7 | 10 | 11.0 |

## CONCLUSIONS

More than half (62%) of the study sample had completed a high school education or more. Even though 56% were on-the-street homeless, 64% considered themselves homeless and 91% experienced being homeless at some point of their life. Of those who received drug or alcohol treatment, 35% were still current drug users. High prevalence of psychiatric diseases (76%), substance dependence of multiple drugs (63%), and homeless chronicity clearly indicate the great necessity of integrated services, targeted to the particular needs of this population.

## ACKNOWLEDGEMENTS

We thank the staff of *Las Duchas* and *La Fondita de Jesús*, particularly Ms. Ramonita Pons, Mr. Luis Torres, Dr. Arcady Rodas and Ms. Mónica López for their unconditional support. Also, Ms. Isabel Tirado and Mónica Castellano for their incredible helpfulness throughout the interviewing process.

# Association between health status and homeless chronicity among individuals attending community-based organizations in San Juan, Puerto Rico

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## ABSTRACT

**Background:** Homeless populations have disclosed in many studies their particular needs of health care services, histories of hospitalization, chronic health conditions and mental illnesses. This study assessed the physical and mental health status across residential status of individuals attending community-based organizations (CBOs) in San Juan, Puerto Rico (PR). **Methods:** We performed a cross-sectional survey of 100 individuals aged 21-82 years enrolled in two CBOs that offer services to homeless in San Juan, PR. Face-to-face interviews collected information on socio-demographics, substance use, and access to medical care. The SF-36 health survey was administered to assess health status providing eight norm-based subscales, a Physical Component Summary (PCS) and a Mental Component Summary (MCS). Scores at or below the median were defined as poor physical or mental health status. Multiple logistic regression models were used to evaluate the association between health status and homeless chronicity. Models for PCS and MCS were generated separately and adjusted prevalence odds ratios (POR) were calculated. **Results:** Residential status was distributed as follows: 56.0% on-the-street homeless, 9.0% transitionally-housed and 35.0% housed. Mean PCS and MCS scores were 49.6±11.8 and 42.2±14.4, respectively. MCS unadjusted POR for on-the-street and transitionally homeless individuals were 2.88 (95% CI: 1.22-6.77) compared to housed individuals. PCS unadjusted POR for on-the-street and transitionally homeless individuals were 1.58 (95% CI: 0.56-4.43) compared to housed individuals. After adjusting for polydrug use and CBO as a random intercept, on-the-street and transitionally homeless were 2.57 (95% CI: 1.07-6.17) times more likely to have a poor mental health status than housed individuals. After adjusting for HIV, anxiety disorder and CBO as a random intercept, on-the-street and transitionally homeless were 1.27 (95% CI: 0.52-3.11) times more likely to have a poor physical health status than housed individuals. **Conclusions:** These findings underscore the need for more aggressive prevention and treatment programs targeting homeless adults in San Juan, PR.

## BACKGROUND

Public health faces the tremendous challenge of homelessness. Not only is this situation alone complex, but very likely to interconnect with other problems like physical and mental health conditions, drug use and other negative health-related outcomes. Puerto Rico suffers from the unsolved and increasing issue of homelessness, being San Juan shelter of 27% of all the population in the island. More epidemiological data targeting the needs of homeless individuals are constantly at need for the planning of more effective interventions and innovative public policies.

## STUDY AIMS

- To describe the population under study according to their socio-demographical characteristics, health related factors, drug use practices and access to health care.
- To assess the physical and mental health status by residential status using the 36-item short form health survey (SF-36).
- To estimate the magnitude of the association between health status and homeless chronicity adjusting for potential confounders such as socio-demographic characteristics, health related factors, drug use practices and access to health care.

## METHODS

- **Study population**:
  Individuals were selected from two CBOs that offer services to homeless in San Juan, Puerto Rico. A convenience sample of 100 individuals was selected using the following criteria: (1) older than 21 years of age (2) currently participating at a program that offer services to homeless in San Juan and (3) cognitively able to provide informed consent.
- **Study design**:
  Cross-sectional study
- **Data collection**:
  Face-to-face interviews collected information on socio-demographic characteristics, health status, access to medical care and drug use practices. Residential status was defined as transitionally housed (living with friends, family or others) and on-the-street homeless (living on the street or in a shelter).

## RESULTS

Table 1. Socio-demographic characteristics and residential status of study population

| | | Overall (n = 100) | |
|---|---|---|---|
| | | n | % |
| CBO | | | |
| La Fondita de Jesús | | 55 | 55.0 |
| Las Duchas | | 45 | 45.0 |
| Sex | | | |
| Male | | 93 | 93.0 |
| Female | | 7 | 7.0 |
| Age in years | | | |
| 21 - 40 | | 31 | 31.0 |
| 41 - 60 | | 60 | 60.0 |
| 61 - 82 | | 9 | 9.0 |
| Mean±SD | 46.8±11.3 | | |
| Education | | | |
| Less than high school | | 38 | 38.0 |
| Completed high school | | 25 | 25.0 |
| More than high school | | 37 | 37.0 |
| Some college | | 13 | 13.0 |
| Associate's degree | | 15 | 15.0 |
| Bachelor's degree or more | | 9 | 9.0 |
| Source of income* | | | |
| Welfare | | 62 | 62.0 |
| Odds jobs on the streets | | 52 | 52.0 |
| Salary | | 20 | 20.0 |
| Residential Status | | | |
| On-the-street homeless | | 56 | 56.0 |
| Transitionally housed | | 9 | 9.0 |
| Housed | | 35 | 35.0 |
| Self-perception of homelessness | | | |
| On-the-street homeless | | 49 | 87.5 |
| Transitionally housed | | 6 | 66.6 |
| Housed | | 10 | 28.6 |
| Longest time lived on the streets | | | |
| ≤ 3 years | | 63 | 68.2 |
| 4 - 6 years | | 16 | 18.6 |
| ≥ 7 years | | 10 | 11.0 |

* Categories are not mutually exclusive
SD: Standard deviation

Table 2. History of drug use in the past 12 months by study participants

| | Overall (n = 100) | |
|---|---|---|
| | n | % |
| Drug users | 54 | 54.0 |
| Polydrug users | 34 | 63.0 |
| Types of drugs used* | | |
| Marijuana | 31 | 57.4 |
| Crack | 26 | 48.1 |
| Cocaine† | 19 | 35.2 |
| Heroine† | 13 | 24.1 |
| Analgesics / sedatives | 11 | 20.4 |
| Speedball‡ | 10 | 18.5 |
| Amphetamines | 1 | 1.8 |

* Categories are not mutually exclusive
† Inhaled and snorted only
‡ Packets mix of cocaine and heroine

Figure 1. Number of self-reported diagnosed health conditions and percent of people who received treatment among study participants (n = 100)

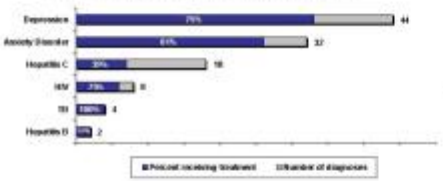



Table 3. Access to health care factors of study population

| | Overall (n = 100) | |
|---|---|---|
| | n | % |
| Health insurance | | |
| None | 23 | 23.0 |
| Public | 73 | 73.0 |
| Private | 4 | 4.0 |
| Unable to access health care services | 38 | 38.0 |
| Usual source of health care | | |
| Outpatient department | 48 | 48.0 |
| Emergency room | 28 | 28.0 |
| Physician's office | 16 | 16.0 |
| CBOs | 8 | 8.0 |
| Received drug or alcohol treatment | 54 | 54.0 |
| Perception of health | | |
| Excellent | 17 | 17.0 |
| Good | 36 | 36.0 |
| Fair | 27 | 27.0 |
| Poor | 18 | 18.0 |

* Community health clinic specialized in homeless health care

Figure 2. SF-36 subscales norm-based mean scores of study participants compared to a general US population (n = 100)

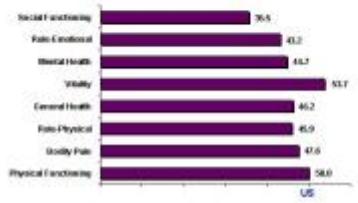



Table 4. Adjusted POR estimation to assess the association of SF-36 mental health score (MCS) at or below the median and residential status

| | Unadjusted† | | | Adjusted‡ | | |
|---|---|---|---|---|---|---|
| | POR | 95% CI | P | POR | 95% CI | P |
| Housed§ | 1.00 | | | 1.00 | | |
| On-the-street and transitionally homeless | 2.88 | 1.22 – 6.77 | 0.02 | 2.57 | 1.07 – 6.17 | 0.04 |

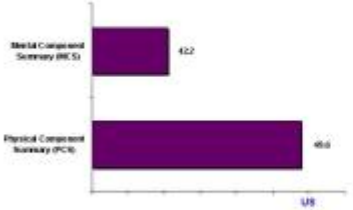
† POR estimating for intervening site as random intercept
‡ Adjusted for polydrug use and intervening site (random intercept)
§ Reference category
MCS reference category: above the median

Table 5. Adjusted POR estimation to assess the association of SF-36 physical health score (PCS) at or below the median and residential status

| | Unadjusted† | | | Adjusted‡ | | |
|---|---|---|---|---|---|---|
| | POR | 95% CI | P | POR | 95% CI | P |
| Housed§ | 1.00 | | | 1.00 | | |
| On-the-street and transitionally homeless | 1.58 | 0.56 – 4.43 | 0.39 | 1.27 | 0.52 – 3.11 | 0.60 |

† POR estimating for intervening site as random intercept
‡ Adjusted for HIV, anxiety disorder and intervening site (random intercept)
§ Reference category
PCS reference category: above the median

Figure 3. SF-36 summary measure norm-based mean scores of study participants compared to a general US population (n = 100)




## METHODS

- **Instrument**:
  To assess physical and mental health status, the SF-36 health survey version 1.0 was administered. This questionnaire generate eight subscales: physical functioning, role-physical, bodily pain, general health, vitality, social functioning, role-emotional and mental health. In addition, a Physical Component Summary (PCS) and a Mental Component Summary (MCS) were constructed. Scores ranged from 0 to 100 and were standardized using general US population data; higher scores being indicative of better health status.
- **Statistical analysis**:
  The SF-36 scores were dichotomized using their median values. Therefore, scores at or below the median were defined as poor physical or mental health status.

  Simple logistic regressions were used to evaluate the variables that were statistically associated ($p<0.05$) to MCS and PCS.

  To evaluate the association between the SF-36 scores and residential status, two multiple logistic regression models with random intercept were generated. The random intercept was chosen to control the effect of the interviewing site. Adjusted prevalence odds ratios were calculated to estimate the magnitude of the associations between health status and homeless chronicity.

## CONCLUSIONS

- Transitionally housed had the lowest MCS mean score (32.6±16.6) and on-the-street homeless the lowest PCS mean score (48.0±12.6).
- After adjusting for polydrug use and interviewing site, on-the-street and transitionally homeless individuals were 2.57 (95% CI: 1.07-6.17) more likely to score at or below the median in the MCS scale than housed individuals. In contrast, our study showed that after adjusting for self-reported HIV, anxiety disorder, and interviewing site, on-the-street and transitionally homeless individuals were 1.27 (95% CI: 0.52-3.11) times more likely to score at or below the median in the PCS scale than housed individuals; however, this result was not statistically significant.
- The results presented in this study support the hypothesis that the mental health status among on-the-street and transitionally homeless is worst than the mental health status of housed individuals.
- The prevalence of self-reported psychiatric conditions and substance use was considerable, and an increasing need for more specialized programs tailored to the needs of people experiencing homelessness in San Juan is tremendously needed.
- Consistent with the recommendations of the National Health Care for the Homeless Council (2009), expanding and strengthening the health care programs that respond to and prevent homelessness in San Juan will minimize its impact on their communities.

## ACKNOWLEDGEMENTS

We thank the participants and staff of *Las Duchas* and *La Fondita de Jesús*, particularly Ms. Ramonita Pons, Mr. Luis Torres, Dr. Arcady Rodas and Ms. Mónica López for their unconditional support. Also, Ms. Isabel Tirado and Mónica Castellano for their incredible helpfulness throughout the interviewing process.

## CONTACT INFORMATION

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