

SUICIDE IDEATION AND ATTEMPT
AMONG A SAMPLE OF PREVIOUSLY HOMELESS INDIVIDUALS

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ABSTRACT

ADAM K. WALSH: Suicide ideation and attempt
among a sample of previously homeless individuals
(Under the direction of Kim Strom-Gottfried)

Introduction: This dissertation describes the factors associated with homelessness, the prevalence and documented risk factors of suicide among the general population, and a review of the major studies on suicide among the homeless. In addition, this paper introduces a risk amplification model of how the condition of homelessness may exacerbate pre-existing bio-psychosocial problems, which in turn may increase the risk of suicide ideation and attempts. The dissertation describes study results, conclusions, and implications for social work research and practice.

This dissertation examined the frequency and the associated risk factors of suicide ideation and attempts among a sample of PHI. Factors such as substance abuse, mental health problems, physical illness, race, gender, age, and the individual's history of homelessness were examined to determine which factors were associated with suicide ideation and attempts among a sample of PHI.

Methods: The cross-sectional data used for this dissertation study were taken from a larger research project, which focused on the cost effectiveness of PSH (see appendix A). The study sample consisted of 226 PHI who received PSH from six separate PSH sites. Study participants were interviewed while in a PSH program and were asked retrospectively about suicide behaviors and experiences prior to receiving

PSH. Quantitative data regarding demographic characteristics, suicide ideation and attempts, substance abuse problems, mental health problems, number of homeless episodes, physical health problems, were gathered using the study questionnaire developed for the Cost Effectiveness project.

Results: Results indicate that this sample of PHI reported thoughts and attempt of suicide more frequently than has been reported in the general population. Mental health disorders were associated with suicide ideation and attempts. Substance abuse problems were associated with suicide attempts at the bivariate level, but were not associated with suicide attempt when individual mental health disorders were added into logistic regression models. Chronic pain was associated with suicide ideation but not suicide attempt. Chronic pain remained a significant factor associated with suicide ideation after controlling for mental health disorders. Chronic homelessness, age, gender, race, and age when first homeless were not associated with suicide thoughts or attempt.

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LIST OF ABBREVIATIONS AND KEY TERMS

Chronic Homelessness: Four or more separate episodes of homelessness. Or being without a fixed about for more than 365 consecutive days (Burt, 1999).

Permanent Supportive Housing (PSH): PSH refers to the provision of permanent affordable housing to previously homeless individuals, followed by the linkage to appropriate medical and social services (Ridgeway, 1994). Housing and services acquired by homeless individuals of their own accord are excluded from this definition.

Previously Homeless Individuals (PHI): PHI refers to those people who formerly lacked a permanent, regular nighttime residence of their own. Transitional places such as shelters, prisons, and mental health and substance abuse treatment centers do not qualify as PSH. (U.S. Department of Housing and Urban Development, 2008).

Suicide Attempt: A non-fatal act (i.e., an overdose of pills not resulting in death) initiated by a person who has the intention of dying (Kessler, Berglund, Borges, Nock, & Wang, 2005).

Suicide Ideation: Thoughts or mental images centering on killing oneself. Such thoughts and images represent severe mental distress and can be fleeting or constant (Kessler, Berglund, Borges, Nock, & Wang, 2005).

OVERVIEW

A. Introduction

Despite considerable wealth, industrialization, and scientific and technological advances in the United States, homelessness persists as a serious and devastating problem. On any given night, approximately 840,000 people are homeless (National Law Center, 2007). Much has been written concerning the causes of homelessness, the demoralizing effects of homelessness, and the factors that perpetuate the condition of homelessness. Alarming, scant research exists on suicide behavior among homeless individuals. Specifically, very little is known about the effect homelessness has—by itself, or combined with other risk factors—on suicide behavior. Not only is there a paucity of observational, descriptive, and epidemiological studies documenting suicide behavior among the homeless, but few intervention studies have targeted suicide behavior among the homeless. Researchers and clinicians have recently expressed an urgent need for research on suicide behavior among homeless individuals (Christensen & Garces, 2006; Fitzpatrick, Irwin, Lagory, & Ritchey, 2007; Saitz, Gaeta, Cheng, Richardson, Larson, & Samet, 2007; Wong & Piliavin, 2001). “We are desperate to prevent others from a similar fate [homeless individuals who die by suicide]; with so many vulnerable lives at stake, the call for clinically applicable research could not be more urgent” (Christensen & Garces, p. 447).

This paper describes, examines, and critiques the pertinent literature, relevant theories, selected published interventions, and key methodological issues on the topic of suicide behavior among the homeless. Second, the paper describes the research methodology and procedures used for the dissertation study. Third, results from the dissertation study, including figures and graphs, are presented. The paper concludes with a discussion of the findings and their implications for social work practice, policy, and research.

B. Background and Significance

1. Homelessness

The United States government offers the following as the definition of homeless:

- 1) an individual who lacks a fixed, regular, and adequate nighttime residence;
and
- 2) an individual who has a primary nighttime residence that is —
 - a. a supervised publicly or privately operated shelter designed to provide temporary living accommodations (including welfare hotels, congregate shelters, and transitional housing for the mentally ill);
 - b. an institution that provides a temporary residence for individuals intended to be institutionalized; or
 - c. a public or private place not designed for, or ordinarily used as, a regular sleeping accommodation for human beings. (U.S.

Department of Housing and Human Development, 2008, p. 1)

This is the definition most commonly used by most researchers, scholars, and policymakers when studying, writing, and developing laws and programs regarding the homeless. As many as two to three million people experience homelessness during an average year (Burt, 2001). In the last 20 years the number of homeless individuals has increased (National Coalition for the Homeless, 2007). Approximately 42% of the homeless population is African American, while 13% is Hispanic, 4% Native American, 2% Asian, and 39% White (National Law Center). When these percentages are compared to the general U.S. population percentages—14% African American, 15% Hispanic, 1% to 2% Native American, 5% Asian, and 81% White (U.S. Census Bureau, 2007)—it becomes apparent that African Americans and Native Americans are disproportionately affected by homelessness.

A majority of homeless individuals are single males in their thirties and dwell in inner cities (Kelly, 2001). Approximately 25- 40% of homeless individuals suffer from a mental illness; half have substance abuse problems, and a little under a third report serious physical conditions (Hawg & Dunn, 2005; Kelly, 2001; Koegel, 1996). The serious physical conditions include diabetes, cardiovascular problems, HIV, and chronic pain problems, among others (Hawg & Dunn, 2005). Many homeless individuals report that at one time in their lives (most commonly during their childhood) they experienced some type of physical, sexual, and/or emotional abuse (National Alliance to End Homelessness, 2005).

Studies suggest many causes of homelessness, including any or a combination of the following: living in poverty, loss of employment, drug and alcohol addiction, victimization, family conflict, mental illness, unavailability of affordable housing, and

negative stigmatization (Main, 1998). In turn, homelessness can cause or exacerbate many of the same conditions that led an individual to become homeless (Main, 1998). These structural and individual risk factors for homelessness appear to work together and amplify one another (Hwang & Dunn, 2005; Main, 1998). For example, if an individual is poor (structural) and suffering from a serious mental illness (individual) and then suddenly loses his or her job (structural and or individual), the stress of the lost job can exacerbate the mental illness. This exacerbation of the mental illness may lead to hospitalization or make it difficult to find another job. With no job, worsening mental illness, and a lack of affordable housing (structural), this individual is at high risk of becoming homeless. It is unclear whether one or a combination of these risk factors is a stronger predictor than the others, except for the risk factor of poverty (Hawg & Dunn, 2005; National Coalition for the Homeless, 2007).

In regard to homelessness, the risk factor of poverty stands above the other risk factors and is systemically influenced by public policies such as the lack of universal housing and health insurance, the elimination of safety net programs for the poor, and a scarcity of affordable rental housing (National Coalition for the Homeless). Additionally, the recent increase in housing foreclosures (beginning in 2007) coupled with the failing economy has led to an increase in the number of homeless in many communities (National Coalition for the Homeless, 2008). On average, a person living in the U.S. working at minimum wage would need to work 89 hours a week to afford a two-bedroom apartment (based on allotting 30% of income for rent/mortgage; Pable, 2007).

2. Suicide and the general population

Suicide is the fourth leading cause of death among adults ages 18 to 65 in the United States; approximately 32,000 people die by suicide each year (American Foundation for the Prevention of Suicide, 2005). *Suicide behavior* includes thinking of suicide, attempting suicide and completing suicide (Kessler, Berglund, Borges, Nock, & Wang, 2005). On an annual basis, approximately 3% of the U.S. population seriously thinks about committing suicide (Kessler et al., 2005). Further, 1,500 people each day attempt suicide in the U.S. (American Foundation for the Prevention of Suicide, 2005). Lifetime prevalence of suicide ideation for adults living in the US is between 11% and 16% and for attempt is between 3% and 5% (Weismann et al., 1999). Close to 90% of completed suicides involve people with a diagnosed or diagnosable mental illness, and 30% of completed suicides involve individuals with alcohol or other drugs in their blood system at the time of death (NIMH, 2009). Nearly 30% of all individuals diagnosed with depression report suicide ideation (American Foundation for the Prevention of Suicide, 2005). Mental health and substance abuse problems are considered the strongest predictors of suicide attempt among general population adults living in the United States (NIMH, 2009). The experience of severe and enduring pain, independent of chronic illness and psychiatric disorder, has been shown to increase the report of suicide ideation and attempt (Llgen, Ziven, McCammon, & Valenstein, 2008). Twice as many females attempt suicide but men are 3 times as likely to actually kill themselves (American Foundation for the Prevention of Suicide). Young adults ages 15 to 24 report the most suicide ideation and attempt, and elderly Caucasian men are at highest risk of committing suicide (American Foundation for the Prevention of Suicide, 2005).

Although reducing deaths from suicide is the ultimate goal of interventions, understanding and documenting suicide ideation and attempt is critical in preventing completed suicide (Kessler et al., 2005). Five years ago the U.S. Surgeon General called for the collection of data that clearly document suicide ideation and attempt, hoping these data could help inform national health care policy (Kessler et al., 2005). Further, the experiences of thinking about or attempting suicide are profoundly distressing and in and of themselves and thus warrant further study and intervention (Kessler et al., 2005; Tarrier, Taylor, & Gooding, 2008). The literature on suicide suggests that suicide can be effectively prevented by early detection of warning signs and intervention by way of antidepressants and individual and group psychotherapy (Tarrier, Taylor, & Gooding, 2008). Less empirical data is available to know if interventions that target an individual's social, structural, and dispositional status directly target the warning signs of suicide. However, preliminary findings from supportive housing interventions point toward the improvement in general mental health outcomes (Tsembaris, Gulcer, & Nakae, 2004).

C. Homelessness and suicide

1. Overview of existing research evidence

Remarkably, little research has specifically investigated suicide and homelessness (Desai, Liu-Mares, Dausey, & Rosenheck, 2003; Eynan et al., 2002; Fitzpatrick et al., 2007; Prigerson, Desai, Liu-Mares, & Rosenheck, 2003; Schutt, Meschede, & Rierden, 1994). There is no consensus on why the topic of suicide among the homeless has failed to receive more scientific investigation (Christensen & Garces, 2006). From a human behavior theoretical perspective, food, shelter, and safety top the list of human needs. Homeless individuals typically lack all three vitally important

necessities. Thus, it is understandable why much of the research on homelessness is focused on addressing food and shelter security. In addition, homeless individuals are by definition transient and difficult to contact and track, making it difficult to engage them in research. Stigma may account for the failure to allocate resources and direct attention to suicide among the homeless. Despite efforts to view homeless individuals as equals and worthy of help, negative perceptions of homeless individuals as “lost cause, beyond help,” “criminals,” “lazy,” and “psychotic” still exist (Morrell, 2007). Nonetheless, a few studies do exist and offer a starting point for further research.

The existing research indicates that homeless individuals are at much higher risk of suicide ideation and attempt compared to the general population. These studies, all cross-sectional, retrospectively inquired if the homeless person was suicidal any time during his/her life or in the last month. The studies do not capture if the participants were suicidal before they were homeless and do not gauge whether the suicide behavior dissipated after receiving services and or shelter. Because these studies are cross-sectional and do not assess for suicide during the time in which the participant was housed, the findings cannot establish if the condition of homelessness, by itself, leads directly to increased suicide behavior. However, the findings from studies on homeless individuals and suicide behavior have indicated that more homelessness, either by being chronically homeless or spending more days homeless, leads to greater reports of suicide attempt and ideation (Desai et al., 2003; Enyan et al., 2002; Prigerson et al., 2002).

Only a few studies have been designed to determine how factors other than homelessness (i.e., gender, mental illness, age, substance abuse) contribute to the high incidence of suicide ideation and attempt among the homeless. All of the studies on

suicide and homelessness that have included mental illness as a variable have shown it to be a factor strongly associated with suicide ideation and attempt. Mood disorders (e.g., depression, bipolar disorder) and thought disorders (e.g., schizophrenia) have been shown to be the two mental illnesses most strongly associated with suicide ideation and attempt (Desai et al, 2003; Enyan et al., 2002). However, most of the homelessness studies that yielded a strong association between mental illness and suicide behavior stemmed from studies designed to examine outcomes of chronically mentally ill individuals (Desai et al., 2003; Prigerson et al., 2003). Not all homeless individuals have a chronic mental illness (Kelly, 2001); therefore it is not known if suicide behavior is solely an outcome of mental illness or if there are other factors that increase risk of suicide among homeless individuals who are not chronically mentally ill.

Consistent with suicide studies done with the general population, studies investigating suicide among the homeless have found that women are more likely to report suicide ideation and attempt than men (Enyan et al., 2002). In addition, single, non-replicated studies have produced findings that suggest homeless individuals who are in their thirties are at a higher risk of suicide behavior. This finding is inconsistent with suicide studies conducted with the general population, which show that young adults ages 15 to 24 and men who are in their seventies are at the highest risk of suicide behavior. Also, one study found that among the homeless, substance abuse increases the risk of suicide only among men in their fifties (Prigerson, Desai, Liu-Mares, & Rosenheck, 2003). Among the general population, substance use has been consistently shown to heighten the risk of suicide behavior, and especially the completion of suicide, in adults

regardless of age. The strength and consistency of the association between substance abuse and suicide behavior among homeless individuals needs further investigation.

Only one study has been designed to measure possible protective or mediating factors of suicide among the homeless. This particular research project was crafted to assess the possible buffering affects of social capital on suicide behavior among the homeless (Fitzpatrick et al., 2007). It was found that only formal social support, such as support from case managers—and not informal social supports, such as friends—decreases suicide behavior. The researchers made attempts to derive a representative sample of homeless individuals. Participants were sampled from shelters, soup kitchens, and public places where homeless individuals were known to frequent. However, the sample was fairly small (N=161) and researchers did not appear to sample individuals residing together in tent communities, or groups in wooded areas. Contrary to the above study, anecdotal information (Morrell, 2007) suggests that a homeless individual receives social support from other homeless people, and this support may be instrumental in helping the homeless individual survive on the streets. Further research is needed to determine if informal social networks among the homeless mediate suicide behavior.

2. Specific studies

While studying the causes of morbidity among the homeless, several researchers discovered that suicide accounted for a significant number of deaths (Barak, Cohen, & Aizenberg, 2004; Barrow, Herman, Cordova, & Struening, 1999; Saitz et al., 2007). In one cross-sectional study inquiring about lifetime suicide ideation and attempt among a sample of 330 Canadian shelter dwellers, 56% of men and 78% of women reported thoughts of suicide and 28% of men and 57% of women reported having attempted

suicide (Eynan et al., 2002). In another cross-sectional study which used the nationwide Access to Community Care Effective of Services and Supports (ACCESS) dataset (N= 7,224), it was discovered that 66% of the participants reported lifetime suicide ideation and 51% had a lifetime history of a suicide attempt (Desai et al., 2003). In addition, it was found that in the 30 days prior to the research interview, 38% of the sample reported suicide ideation and 8% an attempt. More recently, a study of 161 homeless individuals found that 31% of the sample reported wanting to kill themselves during the time since being homeless (Fitzpatrick et al., 2007).

Other research, while not specifically studying suicide behavior, shows that homeless individuals report a high level of psychological distress compared to the general population (Wong & Piliavin, 2001). This particular study employed a longitudinal design and used a probability sample (N= 430) derived from a large community in California (Wong & Piliavin, 2001). Another study, this one including the outcome of suicide behavior, concluded that a heightened level of psychological distress increases the likelihood of suicide behavior (Schutt, Meschede, & Rierden, 1994). This study (N= 218) sampled three Boston area shelters and found that the same stresses (as measured by a depression inventory) that cause psychological distress in the general population cause psychological distress in the homeless population (Schutt et al., 1994). This finding contrasts with those of other suicide and homeless researchers. For example, Gelberg and Lynn (1989) suggest that 90% of the homeless population report perceived psychological distress, compared to 49% reported by the general population. Other studies underline the important role the condition of homelessness plays in increasing the level of vulnerability

to suicide behavior (Desai et al., 2003; Eynan et al., 2002; Fitzpatrick et al., 2007; Prigerson et al., 2003).

The study that found no difference in psychological distress between the general population and the homeless did not comprehensively measure psychological distress, and it relied exclusively on a depression scale to evaluate distress. There are many other indicators and sources of distress beyond depression, such as isolation, anxiety, victimization, violence, unemployment, and poor physical health. A scale designed to capture these different domains of psychological distress that homeless individuals experience is needed to make the claim that homeless individuals experience the same type and level of psychological distress as the general population. The studies that did show a difference in the type and intensity of psychological distress reported by homeless individuals used measures that accounted for distress incurred by a lack of financial resources, unemployment, substance abuse, a lack of social support, chronic physical illnesses, and barriers to medical services (Gelberg & Linn, 1989; Wong & Piliavin, 1989).

Utilizing the same dataset from the nationwide Access to Community Care Effective of Services and Supports (ACCESS) study as was used in another study on homelessness and suicide, Prigerson et al. (2003), concluded that homeless mentally ill individuals are at greater risk of suicide ideation and attempt when they are in their thirties (Prigerson et al., 2003). Another finding from this study is that homeless women are more likely to report suicide ideation and attempt compared to men (Prigerson et al., 2003). The finding that homeless women are at an increased risk for suicide ideation and attempt when compared to homeless men was corroborated by a study conducted with

330 homeless Canadians (Enyan et al., 2002) An unreplicated finding from the ACCESS study indicates that among the homeless, substance abuse is only a risk factor for suicide among older men; among the general population, although substance abuse is a risk for suicide behavior, it has not been linked to a specific age (Prigerson et al.).

The only study that examined childhood trauma as a risk factor for suicide behavior among the homeless was conducted by Schutt, Mesched, and Rierdan (1994). This study sampled 218 shelter dwellers from Boston and demonstrated a strong relationship between childhood trauma and the rate of suicide ideation. The study is cross-sectional; therefore, memory recall is a limitation in identifying when the abuse occurred and the details of the abuse. Also, because it is a cross-sectional study it is impossible to determine if childhood trauma is a specific causal indicator of suicide ideation or one that interacts with other covariates. General population studies have yielded mixed results regarding childhood sexual abuse as a risk factor for suicide (Kessler et al., 2005).

3. Gaps in the research literature on suicide among the homeless

Few studies have examined the determinants of risk for suicide behavior among the homeless; many more studies are needed to understand the complex constellation of factors involved. The few studies that have addressed these issues indicate that the condition of homelessness, by itself, is more than likely a risk factor for suicide behavior (Desai et al., 2003; Eynan et al., 2002; Fitzpatrick et al., 2007; Prigerson et al., 2003). An important challenge to address in quantitative and qualitative research on homelessness and suicide is how to measure the effect homelessness has on suicide. It is important for future research designs to sufficiently measure the degree of human despair that

homelessness represents and how this despair functions in concert with other existing risk factors.

First, attempts should be made to sample homeless individuals from all settings and dispositions, not solely relying on shelter populations; and research needs to include non-treatment homeless populations. There are many homeless individuals who live under bridges, in the woods, abandoned houses and cars, and who “couch hop” from one friend’s home to another (Morrell, 2007). Homeless individuals who seek out shelters and agree to community-based treatment may have different life experiences, including rates of suicide behavior, compared to homeless individuals who do not frequent shelters and participate in community treatment.

Second, more comprehensive descriptive and correlational research is needed to establish the demographic characteristics of homeless individuals who may be at heightened risk for suicide behavior. Further, risk factors for suicide behavior among the general population (e.g., mental illness, substance abuse, gender, age, race, and childhood abuse) should be included in research designs focused on homeless persons. A valid and reliable set of risk factors for suicide among the homeless would allow for higher reliability and validity across studies, increase future research design effectiveness, and improve theory and intervention development.

Third, although it would be very challenging, researchers need to employ longitudinal studies to track suicide behavior among the homeless. Longitudinal studies could be useful to investigate the psychological outcome trajectories of homeless individuals, with the measurement of suicide as the primary outcome. This would assist

in better understanding the temporal and directional relationship between suicide and homelessness.

In addition, longitudinal studies could be used to effectively test interventions aimed to target suicide behavior among the homeless. For example, researchers could design a longitudinal study to measure suicide behavior among one group of homeless persons receiving a specific intervention compared to a group that is receiving treatment as usual. This would help determine if interventions have the capability of reducing the incidence of suicide behavior as compared to the services homeless individuals typically receive.

Fourth, research designs must measure the severity of particular suicide risk factors homeless individuals face. Scholars investigating suicide behavior among the homeless have asserted that homeless individuals experience a level of despair and hopelessness that is more severe and penetrates deeper than hopelessness experienced by other populations (Enyan et al., 2002; Fitzpatrick et al., 2007). Much would be gained if researchers used measurements designed to evaluate the severity of hopelessness, substance abuse, depressive symptoms, trauma, physical functioning, as well as the severity of homelessness itself (i.e., how many days homeless, number of homeless episodes). Researchers could then determine if the level of severity of particular risk factor places a homeless individual at an increased risk for suicide.

Fifth, the array of documentaries and books describing the plight of homeless persons can offer a much-needed contextual backdrop for researchers (Morrell, 2007). Less readily available are qualitative studies specifically designed to capture the experiences homeless individuals have regarding suicide. Narrative, ethnographic, and

phenomenological studies designed to capture stories or emerging themes surrounding the issue of suicide would provide invaluable information about a research area that is underdeveloped.

Qualitative inquiry could capture the very personal and difficult-to-quantify experience of being homeless and suicidal. Open-ended interviews could provide insight into how homeless individuals survive and cope with their conditions and the intersection of suicide ideation with both coping and despair. When suicide ideation or attempt emerges as a theme, researchers can identify common contextual experiences across interviews which may shed light on the mechanisms of risk for suicide. By doing this, researchers would be able to gather clues on what particular experiences and events may have made the person more vulnerable for suicide. For example, if several of the homeless people interviewed relate stories of how feeling hopeless precedes drug relapse, which is then followed by a suicide attempt, researchers may hypothesize about how the risk factors of hopelessness and drug relapse work together to heighten risk for suicide and structure future studies accordingly.

D. Methodological Issues in the Study of Suicide and Homelessness

1. Overview

It has been speculated that complex research methodology may be one of the main reasons why so few studies on suicide and homelessness exist (Christensen & Garces, 2006). Attempting to identify and recruit a sample of homeless research participants is challenging in its own right (Burt, 2001; Cohen et al., 1993). Homeless individuals are a highly transient population, which makes them difficult to locate and subject to research protocols (Cohen et al., 1993; Morrell, 2007). The broad issue of how

to define homelessness and count the homeless affects all homeless research and certainly further complicates research on homelessness and suicide (Williams & Cheal, 2002).

These issues will be further elaborated upon and investigated in the following section.

It has been suggested that more descriptive and epidemiological research is needed to describe and show prevalence rates of suicide behavior among the homeless and further establish a relationship between homelessness and suicide behavior (Christensen & Garces, 2006; Desai et al., 2003; Eynan et al., 2002; Fitzpatrick et al., 2007). To date, all of the studies investigating suicide and homelessness have been cross-sectional, most commonly using a sample of homeless persons in shelters or community treatment programs and retrospectively querying about suicide ideation and attempt during the time the individual was homeless (Desai et al., 2003; Eynan et al., 2002; Fitzpatrick et al., 2007; Prigerson et al., 2003; Schutt, Meschede, & Rierdan, 1994). Studies on homelessness and suicide have also employed semi-structured interviews as the measurement for suicide and have not used specific suicide measurements (Desai et al., 2003; Eynan et al., 2002; Fitzpatrick et al., 2007; Prigerson et al., 2003; Schutt, Meschede, & Rierdan, 1994). The common approach to analyzing data on homelessness and suicide involves a three-step process: 1) compiling descriptive data on the sample, 2) using bivariate chi square models to determine which variables have a statistically significant relationship with suicide, and then 3) using the results of chi square tests to create a regression model to examine which variables are most accurately associated with suicide attempt and ideation (Desai et al., 2003; Eynan et al., 2003; Fitzpatrick et al., 2007; Prigerson et al., 2003).

Longitudinal studies would allow researchers to follow homeless individuals over time while tracking significant covariates that may explain suicide behavior (Shadish, Cook & Campbell, 2002). Another challenge involves isolating the risk factors for suicide among the homeless, and how homelessness, either by itself or in combination with other risk factors, explains suicide behavior. Structural equation modeling (SEM) would be a useful statistical approach in understanding the indirect effects of variables, such as mental health and substance use symptoms, on psychological distress, including suicide behavior among the homeless (Wong & Piliavin, 2001). SEM would identify which variables most strongly predict variance in suicide behavior (Kline, 2005). SEM also affords researchers the opportunity to test mediational models of suicide behavior among the homeless (Kline, 2005), thereby identifying which variables buffer homeless individuals from suicide behavior. Understanding which variables act as protection against suicide behavior among the homeless would contribute to prevention and intervention efforts.

2. Sampling issues

Some of the studies conducted on homelessness and suicide behavior have relied on secondary data, extrapolating items regarding suicide ideation and attempt from large-scale studies of the homeless (Desai et al. 2003; Eynan et al., 2002; Prigerson et al., 2003). Eynan et al. (2002) used data from the Pathways into Homelessness project, while Desai et al. (2003) and Prigerson et al. (2003) used data from ACCESS, which is the national program to provide services to the homeless. The most recent study on homelessness and suicide derived a probability sample from a community census (Fitzpatrick et al., 2007). During a specific 24-hour window, the census enumerated

homeless individuals from shelters, persons living on the streets, and those frequenting soup kitchens (Fitzpatrick et al., 2007). This method may have failed to control for duplicates: a homeless individual could have been counted at the shelter, on the street, and at the soup kitchen. It is not uncommon for homeless individuals to frequent all three places in a 24-hour period. Not controlling for duplicates presents a threat to the external validity of the study. Because of this threat to external validity, it may not be possible to generalize this study to all homeless, as the “random probability sample” inferred.

In another study, Schutt and colleagues (1994) randomly selected participants from three shelters in Boston. The study recognizes that the findings are difficult to generalize to those homeless individuals who do not use shelters (Schutt, Meschede, & Rierden, 1994). The homeless population in general is heterogeneous and varies greatly from one day to the next and between one community and the next, making it very difficult to generalize findings from one study sample of homeless individuals to all homeless individuals (Schutt, Meschede, & Rierden, 1994).

3. Measuring and defining homelessness

Enumerating the homeless is a great challenge and has significant ramifications for program funding, research, and public attention to the problem of homelessness (Cordray & Pion, 1991; Hawg & Dunn, 2005; Morrell, 2007). The approach to counting the homeless is commonly predicated on how a particular organization or community defines homelessness (HUD, 2008). While the standard definition established by the federal government is used by most agencies and communities, some use their own definitions, which in turn introduces problems about how to interpret the results of homeless counts (Cordray & Pion, 1991). There are several commonly used approaches

to counting the homeless: 1) shelter counts, 2) service utilization counts, 3) expert counts, 4) point-in-time counts, and 5) capture-recapture (Burt, 1996; Williams & Cheal, 2002). All of these methods have advantages and disadvantages and thus a standard method of measurement has not been selected (Cordray & Pion, 1991; Culhane, Dejowski, Ibanez, Needham, & Macchia, 1994).

Shelter counts involve asking shelters in a particular community to either tally how many homeless individuals are staying at a shelter on a designated night or to submit the average number of people per year who stay at the shelter (Burt, 1996). By definition, shelter counts do not account for homeless individuals who are not staying at a shelter. Other methods have their own deficiencies. Service utilization counts add up how many homeless individuals use a particular homeless service (i.e., soup kitchen) during one point in time or during a year (Burt, 1996) and thus may undercount individuals who do not avail themselves of services. Expert counts rely on representatives of homeless advocacy or service agencies to provide the number of estimated homeless for a particular community. This method is highly subjective and can be influenced by community politics (Cordray & Pion, 1991). Point-in-time counts, which occur on one designated day, most commonly use community volunteers to count the number of homeless; this involves counting homeless people living on the streets, in abandoned houses and cars, under bridges, in the woods in community shelters at soup kitchens and at other transitional housing programs (Culhane et al., 1994). Point-in-time counts are hampered with problems of duplication, over-reliance on certain areas in a community to capture the number of homeless living on the streets, and having only one point in time to represent the whole population of homeless. The number of homeless individuals

dwelling in a particular community can vary greatly from one day to the next (Culhane et al., 1994).

The capture-recapture method was first applied to counting endangered species and now has gained support from homeless researchers, especially in Europe (Williams & Cheal, 2002). It involves a mathematical formula to estimate the number of homeless for a particular community (Williams & Cheal, 2002). Capture-recapture controls for the counting of a homeless individual twice and is based on making at least two independent observations of how many homeless individuals are living on the streets. The formula is as follows:

$$N_t = (N_1 \times N_2) / M$$

where N_t is the total estimated number of homeless individuals living on the streets for a specific community, N_1 is observation one, and N_2 is observation two, and M is the number of duplicated individuals from the separate observations. The two independent observations are multiplied and then divided by the number of duplicates to generate the total estimated number of homeless.

Capture-recapture does not include shelter counts and other homeless individuals staying at transitional sites, but it can be used in conjunction with shelter counts (Williams & Cheal, 2002). This method also assumes that the number of duplicate homeless individuals can be accurately tracked. It does not appear that capture-recapture pinpoints the period of time the calculation is estimating (i.e., a year, month, and day). Despite these problems, capture re-capture is considered a relatively low-cost, convenient way to mathematically estimate the number of homeless living on the streets in a particular community. While the capture- recapture method will need to be further tested

for its reliability in accurately estimating the number of homeless, it seems to be a promising approach to estimating homeless individuals living on the streets (Williams & Cheal, 2002).

Ideally, longitudinal procedures would be employed to track homeless individuals over time (Culhane et al., 1994). This would allow for an accurate, robust, non duplicative count of homeless individuals and provide insight into how many days an individual person is homeless over time (Culhane et al., 1994). Unfortunately, longitudinal methods of studying homeless individuals are very time-intensive (e.g., they require keeping track of the whereabouts of each homeless individual), costly, and require experienced and skilled researchers, all of which affect the feasibility of the method (Culhane et al, 1994).

In a new study released by HUD (2008), the number of homeless individuals was enumerated by utilizing the newly developed homeless information management system (HIMS). HIMS is a national database that tracks the number of homeless individuals living throughout the country (HUD, 2008). Community agencies that interact with homeless individuals enter the type of service a homeless individual receives and the corresponding date of service. HIMS is touted for its ability to consistently track a homeless individual over time, reducing the chance of duplication (HUD, 2008). HIMS is not flawless; homeless individuals who do not come into contact with homeless service providers may not have their information entered into the system, and not all communities utilize HIMS.

4. Measuring suicide ideation and attempt

The most common and accepted approach in examining rates of suicide ideation and attempt is self-report, either asked separately or as part of a diagnostic interview (Kessler et al., 1994; Kessler et al., 2005; Weismann et al., 1999). Further, the self-report method is the approach researchers investigating suicide behavior among the homeless have used (Desai et al., 2003; Fitzpatrick et al., 2007; Prigerson et al., 2003). Typical queries include: “Have you had thoughts of killing yourself?” “Have you felt so low you wanted to kill yourself?” and “Have you tried to kill yourself or made a suicide attempt?” As is the case with all self-report data, the limitations to these queries include social desirability and problems with memory recall. However, self-report has been shown to be a reliable method in measuring suicide ideation among the general population (Kessler et al., 1994; Kessler et al., 2005; Weismann et al., 1999) and in measuring outcomes among the homeless (Burt et al., 1999; Calsyn et al., 1993; Wong et al., 2006).

Few studies have targeted programs to address suicide behavior among the homeless, though there has been a recent call for more research on the effects of permanent supportive housing on health, mental health, and overall well-being of homeless persons (Culhane et al., 2008). Specifically, it has been recommended that experimental and quasi-experimental designs be combined with repeated measures methods in studying health and mental health outcomes of permanent supportive housing (Culhane et al., 2008). For example, studies might compare permanent supportive housing to assertive community treatment (ACT), shelter programs, and other transitional housing interventions to demonstrate which is more effective in improving health and mental health outcomes (Nelson, Aubry, & Lefrance, 2007). Research designs such as a panel design would allow for the repeated measurement of health and mental health

outcomes in the same sample of homeless individuals over time. In the case of investigating the effects of permanent supportive housing on health and mental health outcomes, a repeated measures design could determine if other socio-demographic variables (e.g., ethnicity, past abuse, addiction, history of mental illness) explain the changes in health and mental outcomes. The downside to repeated measure designs are 1) high cost, 2) difficulty recruiting a sample 3) high attrition rate of the research participants, and 4) testing effects, as administering the same measures over and over may lead to respondents giving a canned set of answers (Frankfort-Nachmias & Nachmias, 2000).

CONCEPTUAL FRAMEWORK

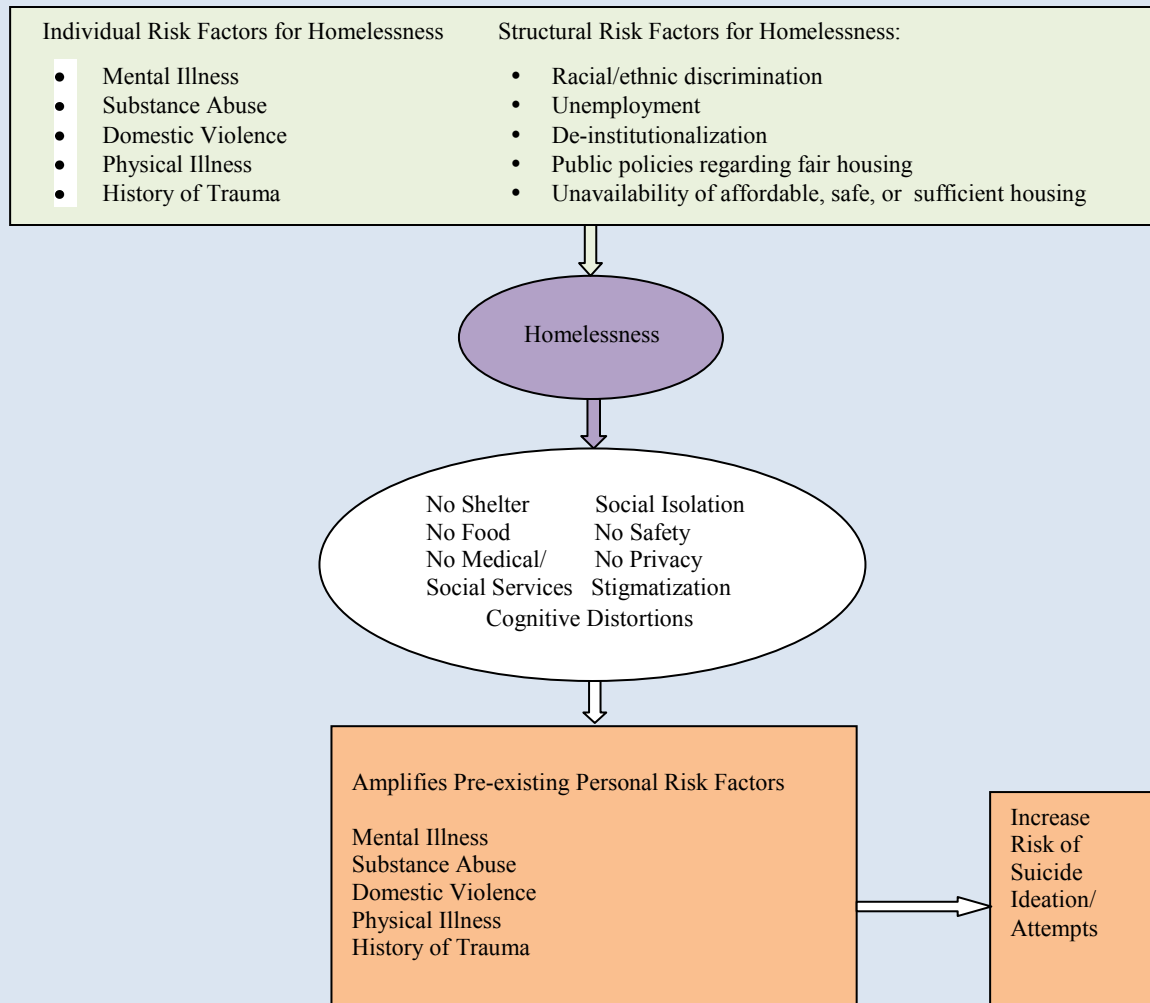
A. Conceptual Framework for Data

The condition of being homeless can be devastating and have an impact on one's mental, physical, spiritual, and social well-being. Interviews conducted with homeless individuals reveal the harsh realities of living without shelter, food, dealing with the stigmatization of being labeled homeless and, in many cases, living in isolation (Liebow, 1993; Morrell, 2007; Pollio & Kasden, 1996). Not having a safe, private, and reasonably clean abode in which to perform simple tasks such as bathing, preparation of food, and resting without fear of violence, significantly affects one's ability to maintain stability and overall well-being (Jencks, 2005; Liebow, 1993; Morrell, 2007; Pollio & Kasden, 1996). When the condition of being homeless is compounded by pre-existing biopsychosocial problems (e.g., mental health disorder, medical disorder, no community or family support), it is understandable that homeless individuals would be at an amplified risk for suicide ideation and attempt.

The risk amplification model posits that current risky behaviors and stressful circumstances can amplify or exacerbate the effects that previous stressful events or experiences have on current outcomes. For example, Whitbeck, Hoyt, and Yoder (1999) tested a risk amplification model with homeless and runaway youth. They found that homelessness increased the likelihood of contact with deviant peers, risky sexual

behaviors, and drug and alcohol use. In turn, these risky behaviors amplified the effects of past family abuse on current depressive symptoms, including suicide (Whitbeck, Hoyt, & Yoder, 1999). In the study reported here, the risk amplification model can aid in understanding how the condition of homelessness can exacerbate pre-existing biopsychosocial problems (e.g., psychiatric illness and drug problems) or trigger effects of past trauma on increasing the risk of suicide ideation. Commonly, the condition of homelessness results in living out in public, under unsafe and unstable conditions (e.g., in abandoned houses, under a bridge), participating in illegal activities to survive (e.g., stealing, trespassing, prostitution), living in isolation, and the loss of one's dignity (Jencks, 2005; Liebow, 1993; Morrell, 2007; Pollio & Kasden, 1996). The conditions associated with homelessness may also intensify dysfunctional and hopeless related thinking (e.g., "I will never have a bed of my own, ever again"). Lacking permanent and stable shelter, engaging in illegal activities, living in isolation, irrational thoughts, and losing one's dignity can conceivably intensify pervasive and chronic conditions and experiences such as depression, bipolar disorder, PTSD, past physical and sexual abuse, addiction, and a physical or medical condition such as diabetes or chronic pain, and past physical and sexual abuse. Furthermore, the condition of homelessness aggravates the pre-existing disorder or trauma, which in turn amplifies the risk of suicide ideation or attempt (see Figure 1).

Figure 1 (Walsh, 2011)
Conceptual Model: Risk Amplification Model of Homelessness and Suicide Behavior



METHODS

A. Primary Study: Cost Effectiveness of PSH in North Carolina Project

This dissertation study uses data which has been collected by the “Cost Effectiveness of Permanent Supportive Housing (PSH) in North Carolina Project.” A brief description of this larger study will be presented here to provide a backdrop on how subjects were recruited, how study procedures and the questionnaire were developed, and how data was collected. The “Cost Effectiveness of PSH in North Carolina Project” was conducted by Dr. Dean Duncan, III, Jennifer Vaughn, MSW, and the author in 2006 (see Appendix A for a detailed description of the project). It was approved by the UNC Behavioral Institutional Review Board.

1. Recruitment of PSH programs/sites and of Previously Homeless Individuals

Research participants were recruited from six PSH programs from the North Carolina cities of Raleigh, Asheville, Greensboro, High Point, and Durham. Investigators of this study learned about existing PSH programs through interviews with key informants regarding homelessness in North Carolina. Purposive sampling was used to select the six sites based on the recommendations made by the key informants.

Three of the programs were considered clustered site programs. These programs housed previously homeless individuals (PHI) together in one large apartment unit complex and had a case manager on site. The other three sites housed individuals in single apartment units that were scattered throughout the city where the program was located.

The scattered site programs provided initial case management and then referred clients to community service providers.

All of the programs were designed to help homeless individuals who were deemed to need housing. An emphasis was placed on providing PSH to those who were in crisis and in immediate need of housing. The decision to accept a PHI into a PSH program was left to the discretion of the PSH program staff. All of the PSH programs accepted homeless individuals from a variety of locations: living on the streets, residing in shelters, and transitioning from prisons, psychiatric hospitals, and drug treatment centers. Several of the programs made it a priority to provide housing to the mentally ill, though they did not turn away those not presenting with a mental illness. Abstinence from drugs and alcohol was not an inclusion criterion at any of the PSH sites studied.

Each PHI residing in the six designated PSH programs was mailed a letter inviting him/her to participate in the study. The letter contained a toll-free number for residents to call if they were interested in the study. In addition, prospective study participants were informed of the research study and of the toll-free number through PSH staff, via PSH program meetings, and through flyers posted in and around the PSH program sites, including common and meeting areas. Once the prospective study participant contacted the study investigators, a suitable time and a private and confidential place was arranged to conduct the interview.

2. Study procedures

Interviews took place at the PSH site (either in the study participant's individual apartment or a meeting room located within the PSH complex) or at the community agency supporting the PSH programs. Study participants did not have to complete the

semi-structured interview to receive the \$20 participation incentive. The study consent was reviewed with the study participant, emphasizing that participation was completely independent of the PSH program and that participation in the study had no bearing on their housing or services. In addition, study participants were reminded that the information they provided was confidential and would only be used for research purposes and that their information would be identified by subject number and not their name.

3. Measurement

A study questionnaire (see Appendix B) was developed based on items and approaches utilized by other state and national surveys of the homeless population (Burt et al., 1999; Wong et al., 2006). The questionnaire gathered data on demographics, subsistence patterns, employment, history of homelessness, self-reported substance abuse and mental health problems, HIV/AIDS and other health problems, and questions regarding service utilization. The questionnaire included five questions regarding mental health problems, three questions about substance abuse, several questions about the receipt of disability benefits, a question about HIV/AIDS, two questions about physical health conditions, and several questions about history and length of homelessness. The questionnaire also included questions about subjective quality of life, client satisfaction with PSH, and numerous questions about service utilization. The questions regarding substance abuse, mental health, subsistence patterns, HIV/AIDS, and physical health conditions were either yes/no questions or categorical questions. All questions were asked by and answers recorded by study investigators.

Approximately halfway through the semi-structured interview, two open-ended questions were asked regarding the study participant's experiences before and after PSH.

The two questions were:

- 1) I'd like to learn about your situation before you started living here. This last time that you were homeless, right before you came into this program (permanent supportive housing program), what was your life like? (Probe for clarification, use statements like "Can you tell me more?" or "Like what?")
- 2) What has your experience been like living here and receiving support from this program (activities, reactions, positive or negative feelings)?

Interviewers asked respondents to clarify and expand on answers when appropriate. Given that the research participants may not have wanted the interviews audiotaped because of the possibility that the tapes could be used for unintended purposes, such as denial of disability benefits, responses to the open-ended questions were written down verbatim.

B. Data Used for Dissertation

Quantitative data from all of the interviews conducted by the "Cost Effectiveness of PSH in North Carolina Project" (n = 232) were used for this study.

1. Missing data

There was no missing data.

2. Suicide

In the structured questions, two items measured suicide ideation and attempt. Study participants were asked if they had thoughts of killing themselves and if they had

made a suicide attempt. Two separate time periods were referenced: 1) several months prior to receiving PSH, and 2) the time since receiving PSH.

The most common and accepted approach in examining rates of suicide ideation and attempt is self report, either asked separately (as in this study) or asked as part of a diagnostic interview (Kessler et al., 1994; Kessler et al., 2005; Weismann et al., 1999). Suicide ideation and attempt is usually queried using the following structure or something similar: “Have you had thoughts of killing yourself?” or “Have you felt so low you wanted to kill yourself?”; and “Have you tried to kill yourself?” or “Have you made a suicide attempt?”

C. Data Collection

All data for this project was collected in individual, 60- to 180-minute, face-to-face semi-structured interviews at six different PSH sites between October 2006 and March 2009 by this investigator and two other colleagues. The interviewers had masters’ level degrees in counseling or social work and had been trained in semi-structured interviewing.

D. Specific Aims

- 1) Calculate the rate of suicide ideation and attempt among a sample of PHI residing in PSH.
- 2) Describe demographic and other psychosocial factors (i.e., mental health, physical health, which PSH site, substance abuse problems, age, gender, race, subsistence programs) associated with suicide ideation and suicide attempt among a sample of PHI residing in PSH.

E. Research Hypotheses

- 1) The rate of suicide ideation and attempt will be higher among a sample of PHI residing in PSH when compared to the general population.
- 2) Self-reported mental health problems, substance abuse, physical illness, number of homeless episodes, age, gender, and race will be associated with suicide ideation and attempt.

F. Statistical Analyses

1. Quantitative

Descriptive statistics were employed to show the distribution of study participants on gender, race, history of homelessness (number of separate episodes of homelessness), mental illness, HIV/AIDS, receipt of different types of social services, substance abuse problems, and physical illness other than HIV/AIDS. Descriptive statistics were calculated using SPSS 17.0. Chi-square tests were conducted to show the bivariate relationship between the various demographic and social variables and suicide ideation and suicide attempt.

To examine the relationship between selected independent variables and *suicide ideation* and *suicide attempt*, *before* and *after* entry into PSH, four separate logit models were analyzed. Logit models are founded on the same general principles of the general linear model. Logit models examine dichotomous dependent variables and were developed in response to the statistical errors researchers were committing while using a dichotomous dependent variable in a regular multiple regression analysis (Aldrich & Nelson, 1984). The logit models were created in and calculated using PASW 18.0.

Given that the outcome variable for this dissertation study was dichotomous, an Ordinary Least Squares (OLS) regression model could not be employed. This is because

having a dichotomous outcome variable violates the assumptions of requiring normality, and homoscedasticity as a normal distribution is unattainable with only two values in a dichotomous variable (Aldrich & Nelson, 1984). Therefore, four separate binary logit models were run using four different dichotomous dependent variables:

- 1) The first model used the dependent variable of *suicide ideation*,
yes or no.
- 2) The second model used the dependent variable of *suicide attempt*,
yes or no.

The logit models included the following independent variables: reported mental health problems (yes or no, and specific diagnosis), history of homelessness (number of separate episodes and length), substance abuse problem (yes or no), physical health problems, which PSH program, age, gender, and race. These independent variables were selected for analysis based on the general population research on suicide (American Foundation for the Prevention of Suicide, 2005) and the research conducted on suicide and the homeless (Desai et al., 2003; Eynan et al., 2002; Fitzpatrick et al., 2007; Prigerson et al., 2003; Schutt et al., 1994). In addition, the independent variables of government subsistence (i.e., social security income or social security disability income), physical illness, and whether the individual was receiving particular types of services such as mental health treatment/substance abuse treatment, were included.

All categorical, independent variables were transformed into dummy variables. A *dummy variable* is a dichotomous variable constructed from an original categorical variable (Hardy, 1993). Inclusion of dummy variables allows for comparisons between components of each categorical, independent variable.

Any interactions between the independent variables were probed using the guidelines offered by Agresti (2002).

RESULTS

A. Overview and Structure

Study results indicate that this particular sample of previously homeless individuals reported higher rates of suicide ideation and attempt as compared to the general population. In addition, suicide behavior was reported to have occurred more often during time spent homeless as compared to time spent in supportive housing. Further, as compared to other study variables, mental health diagnosis and chronic pain were strongly associated with suicide ideation. In regard to suicide attempt, mental health diagnosis and substance abuse problems showed a strong association when compared to other variables, with mental health diagnosis representing the strongest association. Specifics of these findings, along with additional findings will be included in the following statistical analyses sections: descriptive, chi square, and binary logistic regression.

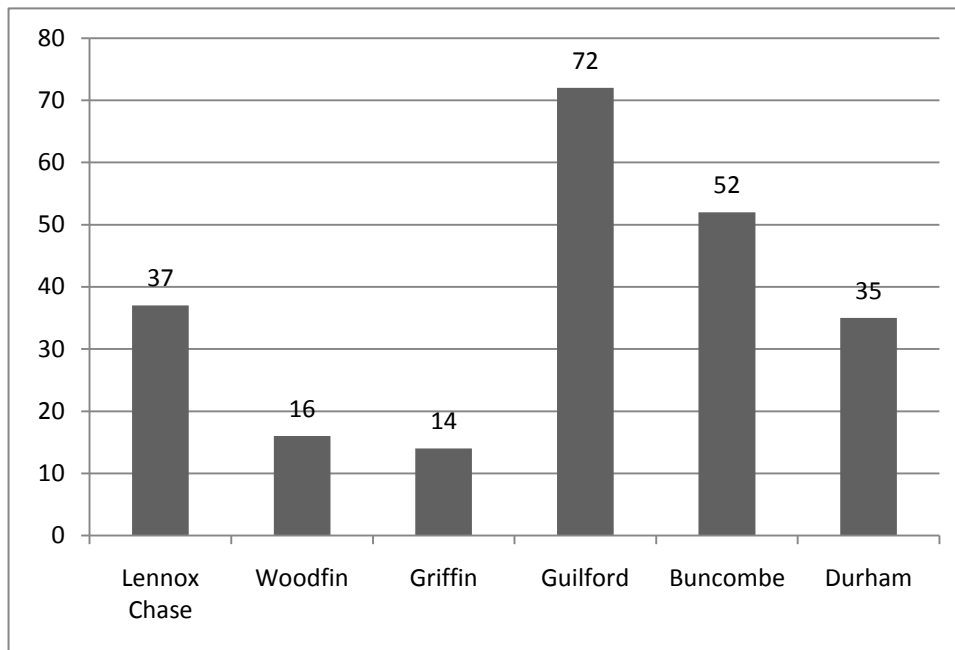
B. Statistical Analyses

1. Descriptive (univariate)

Background variables. A total of 226 previously homeless individuals completed the semi-structured interview. Study participants represented six separate supportive housing programs (see Figure 2) and spent on average six months (range: 1 month - 2 years) in permanent supportive housing prior to being interviewed.

Figure 2

Number of Residents in Each Permanent Supportive Housing Program



The age distribution of the sample leaned toward middle age (see Table 1), with a mean age of 46.2, median of 49, and standard deviation of 9.6.

The mean age when study participants first reported being homeless was 33. On average, study participants reported a lifetime history of 3 separate episodes of homelessness, and nearly one half of the participants indicated that each separate episode of homelessness lasted one year or more.

Approximately 60% of the sample was male ($n = 139$), distributed about equally between Caucasian and African American, with only a few participants represented by other racial and ethnic groups (see Table 1).

Table 1

Sociodemographic Characteristics

Sociodemographic Characteristic	Descriptive Statistics
Age	mean = 46.2 (SD = 9.6) median = 49
Gender	
Male	139 (61%)
Female	87 (39%)
Race	
African American	110 (49%)
Caucasian	105 (46%)
Native American	6 (3%)
Latino	5 (2%)
Current Self-Reported Primary Physical Illness	n = 174
Chronic Pain	60 (27%)
Cardiac Problems	24 (11%)
Hepatitis C	21 (9%)
Respiratory Problems	18 (8%)
Diabetes	16 (7%)
Hypertension	15 (7%)
Brain Injury	11 (5%)
Other	9 (4%)
Current Self-Reported Psychiatric Diagnosis	n = 178
Depression	67 (38%)
Bi-polar	55 (31%)
Schizophrenia	30 (17%)
Anxiety	18 (10%)
PTSD	8 (4%)

Physical health and mental health variables. A majority of participants (77%) reported at least one physical health problem (other than a mental health problem) that was both impairing and warranted medical treatment (see Table 1).

Approximately three quarters (n = 178) of the sample reported being diagnosed with a psychiatric disorder. The disaggregation of the different disorders is displayed below (see Table 1). Roughly two thirds of the sample reported taking psychiatric medications for a psychiatric illness (n = 148).

Service variables. Table 2 summarizes service utilization two years prior to entering permanent supportive housing.

Table 2

Service Utilization

Variable	Descriptive Statistics	
Service Utilization	Yes, received service	No, did not receive service
Social Security Disability	49 (22%)	177 (78%)
Social Security Income	48 (21%)	179 (79%)
Veterans Benefits	5 (2%)	221 (98%)
Psychiatric Hospitalization	77 (34%)	149 (66%)
Incarcerated	107 (47%)	119 (53%)
Emergency Shelter	143 (63%)	83 (37%)
Outpatient Counseling	146 (65%)	80 (35%)
Emergency Room	160 (71%)	66 (29%)
Inpatient Substance Abuse Treatment	65 (29%)	161 (71%)
Medical Insurance	n (%)	
Medicaid	96 (43%)	
None	74 (33%)	
Medicare	37 (16%)	
Private Insurance	12 (5%)	
VA Benefits	7 (3%)	

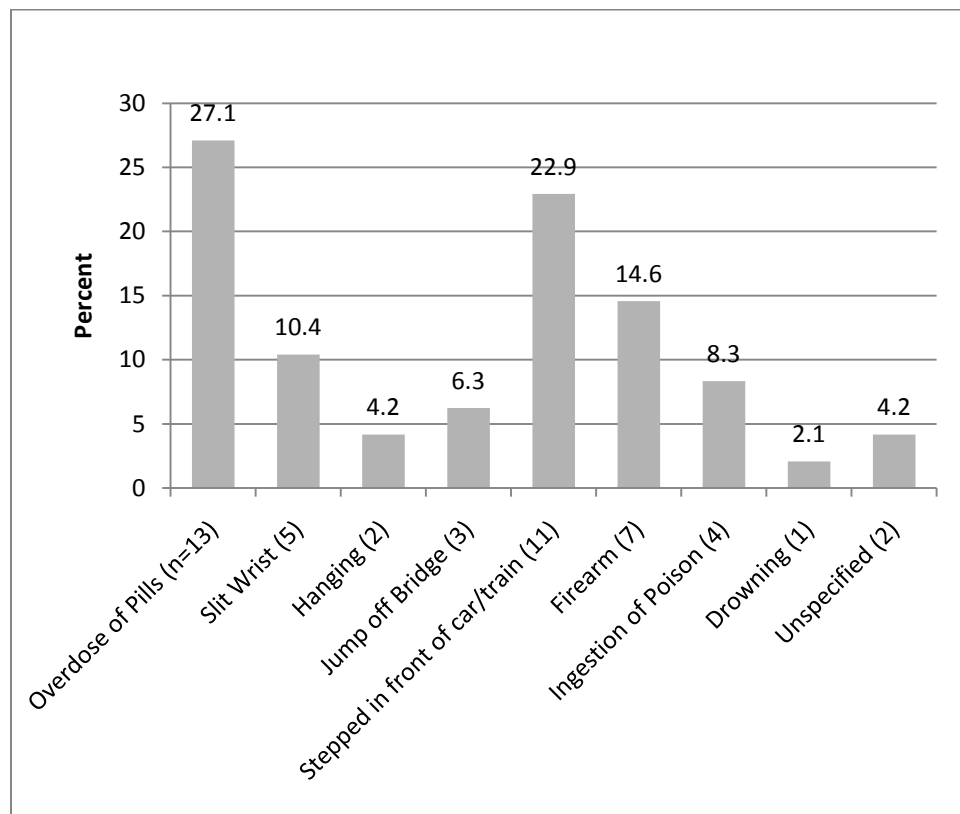
Approximately two thirds of the sample (n = 158) reported having some form of medical insurance (see Table 2), with Medicaid as the most common.

Suicide. Forty-three percent (n = 97) of study participants reported suicide ideation and 21% (n = 48) reported an attempt during the two months prior to entering PSH. In contrast, 9% (n = 20) of participants reported thoughts of suicide and 1% (n = 2) of participants reported an attempt following entry into PSH.

Method of suicide attempt. The methods used to attempt suicide are shown in Figure 3.

Figure 3

Method of Suicide Attempt (n=48)



2. *Chi-square (bivariate)*

In preparation for conducting binary logistic regression and as recommended by Agresti (2002), all study variables were transformed into dummy variables and analyzed using a chi-square contingency test. Each independent variable included in the study hypotheses was entered into separate 2 x 2 chi-square models. For each independent variable, a cross tab was created by placing the independent variable (e.g., no depression = 0, depression = 1) on the x axis and the dependent variable on the y axis (e.g., no suicide ideation = 0, suicide ideation = 1). Chi-squares were conducted separately for suicide ideation and attempt. All chi-square analyses had a degree of freedom (*df*) of 1. The following tables display the chi-square value and significance level. For each significant chi-square, a more detailed table is included. Determining if an independent variable is related to the dependent variable at a significant chi-square level is one method, among others (i.e. theory, past research, sample power), of selecting an independent variable for inclusion in logistic regression analyses. Chi-square analyses indicated a statistically significant relationship between the following independent variables and a suicide attempt: any mental health diagnosis, bipolar disorder (mania), substance abuse problem, psychiatric hospitalization, and taking psychiatric medication. Chi-square analyses indicated a statistically significant relationship between the following independent variables and suicide ideation: *any mental health diagnosis, schizophrenia, chronic pain, psychiatric hospitalization, and taking psychiatric medication.*

Worth noting, there was no statistically significant difference in suicide ideation and attempt across supportive housing program, age, race, length of time homeless, age of first homelessness, serving in the military, and being in foster care as a child.

Suicide Ideation: Chi-Square Analyses

Table 3

Pearson's Chi-Square Correlations of Study Variables: Suicide Ideation as Outcome

Variable – Demographics (N = 226)

Variable	χ^2 Value	Significance
Gender	2.17	.140
Race (Dummy: White vs. Non-White)	5.14	.161
Military Service	0.28	.597
Employment	.369	.544
Age (Dummy: Above vs. Below Median Age)	0.88	.350

Table 4

Pearson's Chi-Square Correlations of Study Variables: Suicide Ideation as Outcome

Variable - Service Utilization (N = 226)

Variable	χ^2 Value	Significance
Psychiatric Medication	10.52	.001***
Psychiatric Hospitalization	20.45	.000***
Foster Care	0.07	.782
Homeless Shelter	1.02	.312
Incarceration	0.62	.431
Social Security Disability	1.72	.189
Social Security Income	2.08	.148
Inpatient Substance Abuse Treatment	3.28	.070
Emergency Room	2.47	.110
Housing Program	0.43	.511

Note. *** $p \leq .001$.

Table 5

Pearson's Chi-Square Correlations of Study Variables: Suicide Ideation as Outcome

Variable – Mental Health Diagnosis and Substance Abuse Problem (N = 226)

Variable	χ^2 Value	Significance
Any Mental Health Diagnosis	9.95	.002**
Schizophrenia	4.12	.042*
Anxiety	0.83	.363
Depression	0.44	.509
Bipolar (Mania)	1.89	.169
Substance Abuse Problem	2.65	.103

Note. * $p \leq .05$. *** $p \leq .001$.

Table 6

Pearson's Chi-Square Correlations of Study Variables: Suicide Ideation as Outcome

Variable – Physical Health Problems (N = 226)

Variable	χ^2 Value	Significance
Any Physical Health Diagnosis	1.23	.289
Cardiac	2.60	.107
Respiratory	0.02	.892
Hepatitis C	0.22	.639
Diabetes	0.01	.945
Hypertension	3.45	.063
Chronic Pain	3.61	.040*
Brain Injury	0.03	.862
Other	0.58	.448
HIV/AIDS	0.07	.782

Note. * $p \leq .05$.

Table 7

Pearson's Chi-Square Correlations of Study Variables: Suicide Ideation as Outcome

Variable – Homelessness (N = 226)

Variable	χ^2 Value	Significance
Chronic vs. Non-chronic	2.78	.097
Homeless More Than One Year vs. Homeless Less Than One Year	0.18	.670
Age First Homeless	1.58	.210

Suicide Attempt: Chi-Square Analyses

Table 8

Pearson's Chi-Square Correlations of Study Variables: Suicide Attempt as Outcome

Variable – Demographics (N = 226)

Variable	χ^2 Value	Significance
Gender	1.30	.245
Race (Dummy: White vs. Non-White)	0.13	.719
Military Service	2.10	.176
Employment	0.10	.746
Age (Dummy: Above vs. Below Median Age)	1.69	.190

Table 9

Pearson's Chi-Square Correlations of Study Variables: Suicide Attempt as Outcome

Variable – Service Utilization (N = 226)

Variable	χ^2 Value	Significance
Psychiatric Medication	13.00	.000***
Psychiatric Hospitalization	28.80	.000***
Foster Care	0.02	.887
Homeless Shelter	0.04	.832
Incarceration	0.54	.459
Social Security Disability	2.00	.170
Social Security Income	1.20	.320
Inpatient Substance Abuse Treatment	3.40	.062
Emergency Room	1.16	.280
Housing Program	1.08	.298

Table 10

Pearson's Chi-Square Correlations of Study Variables: Suicide Attempt as Outcome

Variable – Mental Health Diagnosis and Substance Abuse Problem (N = 226)

Variable	χ^2 Value	Significance
Any Mental Health Diagnosis	24.20	.000***
Schizophrenia	3.03	.082
Anxiety	0.57	.451
Depression	2.27	.132
Bipolar (Mania)	9.94	.002**
Substance Abuse Problem	4.19	.028*

Table 11

Pearson's Chi-Square Correlations of Study Variables: Suicide Attempt as Outcome

Variable – Physical Health Problems (N = 226)

Variable	χ^2 Value	Significance
Any Physical Health Diagnosis	0.16	.687
Cardiac	0.23	.634
Respiratory	1.71	.191
Hepatitis C	1.90	.168
Diabetes	0.79	.375
Hypertension	0.28	.595
Chronic Pain	0.21	.643
Brain Injury	0.25	.616
Other	0.58	.448
HIV/AIDS	1.60	.198

Table 12

Pearson's Chi-Square Correlations of Study Variables: Suicide Attempt as Outcome

Variable – Homelessness (N = 226)

Variable	χ^2 Value	Significance
Chronic vs. Non-Chronic	0.14	.700
Homeless More Than a Year vs. Homeless Less Than a Year	0.18	.670
Age First Homeless	1.10	.254

Suicide Ideation: Independent Variables with Statistically Significant Relationships

Table 13

Association Between Mental Health Diagnosis and Suicide Ideation ($\chi^2 = 9.954$, $p = .002$)

	No Suicide Ideation (n)	Suicide Ideation (n)	Total
No Mental Health Diagnosis	37	11	48
Mental Health Diagnosis	92	86	178
Total	129	97	226

Table 14

Association Between Schizophrenia and Suicide Ideation ($\chi^2 = 4.12$, $p = .042$)

	No Suicide Ideation (n)	Suicide Ideation (n)	Total
No Schizophrenia	117	79	196
Schizophrenia	12	18	30
Total	129	97	226

Table 15

Association Between Chronic Pain and Suicide Ideation ($\chi^2 = 3.615, p = .040$)

	No Suicide Ideation (n)	Suicide Ideation (n)	Total
No Chronic Pain	101	65	166
Chronic Pain	28	32	60
Total	129	97	226

Table 16

Association Between Psychiatric Hospitalization and Suicide Ideation ($\chi^2 = 20.459, p = .000$)

	No Suicide Ideation (n)	Suicide Ideation (n)	Total
No Psychiatric Hospitalization	101	48	149
Psychiatric Hospitalization	28	49	77
Total	129	97	226

Table 17

Association Between Psychiatric Medication and Suicide Ideation ($\chi^2 = 10.528$, $p=.001$)

	No Suicide Ideation (n)	Suicide Ideation (n)	Total
No Psychiatric Medication	56	22	78
Psychiatric Medication	73	75	148
Total	129	97	226

Suicide Attempt: Independent Variables with Statistically Significant Relationships

Table 18

Association Between Mental Health Diagnosis and Suicide Attempt ($\chi^2 = 13.368, p = .000$)

	No Suicide Attempt (n)	Suicide Attempt (n)	Total
No Mental Health Diagnosis	47	1	48
Mental Health Diagnosis	131	47	178
Total	178	48	226

Table 19

Association between Bipolar (Mania) and Suicide Attempt ($\chi^2 = 9.94, p = .002$)

	No Suicide Attempt (n)	Suicide Attempt (n)	Total
No Bipolar (Mania)	143	28	171
Bipolar (Mania)	35	20	55
Total	178	48	226

Table 20

Association Between Substance Abuse and Suicide Attempt ($\chi^2 = 4.195, p = .028$)

	No Suicide Attempt (n)	Suicide Attempt (n)	Total
No Substance Abuse	52	7	59
Substance Abuse	126	41	167
Total	178	48	226

Table 21

Association Between Psychiatric Hospitalization and Suicide Attempt ($\chi^2 = 28.827, p = .000$)

	No Suicide Attempt (n)	Suicide Attempt (n)	Total
No Psychiatric Hospitalization	133	16	149
Psychiatric Hospitalization	45	32	77
Total	178	48	226

Table 22

Association Between Psychiatric Medication and Suicide Attempt ($\chi^2 = 13.067, p = .000$)

	No Suicide Attempt (n)	Suicide Attempt (n)	Total
No Psychiatric Medication	72	6	78
Psychiatric Medication	106	42	148
Total	178	48	226

3. *Binary Logistic Regression (multi-variate)*

Rationale for inclusion of independent variables in logit models. Researchers recommend incorporating valid and relevant theoretical, clinical, and methodological perspectives to sufficiently and accurately explain social science data (Joiner, 2005; Klein, 2005; Rubin & Babbie, 2008). In addition to the research hypotheses, all three of these perspectives were used in variable selection, logit model development, and re-specification.

Theory. The theory of risk amplification, as applied to homelessness, posits that the condition of being without a home and living on the streets amplifies existing problems such as mental health, physical health, and substance abuse problems. The amplification of these problems in turn increases risk for suicide. This theory influenced the study hypotheses. The study hypotheses aim to determine what factors place a PHI at risk for suicide ideation and attempt. Pursuant to testing the research hypotheses and risk amplification theory, only variables that may increase the risk for suicide were considered for inclusion in the logit models. Service variables such as receiving treatment at a psychiatric hospital and receiving psychiatric medicines, though statistically significant at the bivariate level (see Tables 4 and 9), are not considered risk factors for suicide behavior (Goldston et al., 2000). Thus, treatment service variables were not included in the logit models. However, these variables could be used in future studies that examine protective factors for suicide.

Statistical power. To accurately detect a significant logit model at a .05 significance level and to avoid Type II errors, it is necessary to calculate sample power.

Calculating sample power also determines how many independent variables are allowed to be entered into one logit model. According to Peduzzi's (1996) sample size formula for logistic regression, no more than five independent variables for suicide attempt (not including control variables) can be loaded into any one regression model. For suicide ideation, no more than nine independent variables (not including control variables) can be included in any one logit model.

Demographic variables. Research with both general population and homeless samples indicates that gender, age, and racial differences account for variance in suicide behavior (Kessler et al., 2005; Prigerson et al., 2003). Also, it is recommended in the logistic regression literature to control for age, gender, and race during the first step of the analysis (Agresti, 2003). For these reasons, age, gender, and race were included in the analyses.

Mental health variables. Previous research on suicide with homeless individuals and the general population has concluded that mental health problems most strongly predict, above and beyond other variables, suicide behavior (Desai et al., 2003; Enyan et al., 2006; Kessler et al., 2005; Prigerson et al., 2003). In addition, in my own clinical work, those individuals presenting with symptoms of depression or mania were much more likely to have suicidal thoughts or report a suicide attempt than those without these symptoms. Chi-square analysis also demonstrated that the variable *any mental health disorder* was statistically related to suicide ideation and attempt. Therefore, the variable *any mental health disorder* and the variables for each specific self-reported mental health disorder were included all logit models.

Substance abuse problems. Research with the general population also suggests that substance abuse problems are a reliable risk factor for suicide behavior (Aharonovich, Liu, Nunes, & Hasin, 2002). Further, clinical case findings among the general population highlight the role that substance abuse problems play in the contemplation and attempt of suicide (Wenzel, Brown, & Beck, 2009). Findings related to suicide and substance abuse problems involving homeless samples are mixed. One study found substance abuse problems as a risk factor only for homeless men age 50 and older (Prigerson et al., 2003). Chi-square tests showed that the variable *substance abuse problem* was statistically associated with suicide attempt but not ideation. In consideration of all of these reasons, the variable *substance abuse problem* was included in the all logit models.

Physical health problem variables. Physical health conditions have not been cited as a prevalent risk for suicide among the general population (Kessler et al., 2005). The pain associated with these conditions may be related to suicide, however; research with cancer and AIDS patients has shown a strong association between the pain related to these diseases and heightened suicide risk (Kendal, 2006; Marzuk et al., 1988). However, most of the patients in Kendal's (2006) and Marzuk et al.'s (1998) studies suffered from major depressive disorder, and it seems likely depression factored in to the heightened risk for suicide. In the current study, participants were asked if they had any major physical health problems or conditions. Cancer was not reported by any of the participants. While 20 participants reported testing positive for HIV/AIDS, only two of these participants reported a suicide attempt. Considering the low number of participants

who reported suicide behavior and HIV/AIDS, HIV/AIDS was not included in the regression analyses.

Physical pain and chronic pain have been shown to increase the risk for suicide behavior among the general and psychiatric populations (Joiner, 2005). Theory and research suggest that both exposure to pain and feeling pain increase risk for suicide behavior (Joiner (2005). Pain as it relates to suicide has not been studied in homeless samples. In the process of conducting this study, I was fortunate to interview approximately 150 PHI. A common theme that came up when participants spoke of being homeless was the amount of physical pain and discomfort they had to endure (e.g., being assaulted, enduring chronic dental problems, losing hands/fingers because of physical labor, living under inhospitable conditions on the street). Further, chi-square analyses showed a statistically significant relationship between chronic pain and suicide ideation (but not between chronic pain and suicide attempt). Due to the reasons mentioned above, chronic pain was included in the regression analyses. There was no theoretical, clinical, or statistical support to include the other physical health problem variables in the regression analyses, however.

Homelessness variables. Consistent with the risk amplification theory, the more time spent homeless, the greater the amplification of existing problems (i.e., mental health problems), which in turn increases risk for suicide. The research on homelessness and suicide has found that individuals who have been homeless longer report more suicidality (Desai et al., 2003; Enyan et al., 2002). Given the theoretical and previous research support for this variable, it was included in the logit models, though it was not statistically significant at the bivariate level.

Building the logit models. Using the previous evaluation of independent variables and the guidelines offered by Agresti (2002), logit models were constructed by first attempting to find the simplest model that best fits the data. Chi-square tests were conducted to check for interactions between the independent variables in the various logit models. The only independent variables that were statistically inter-related were *substance abuse problem* and *any mental health diagnosis*. The interrelation between these two variables was statistically problematic only when modeling suicide attempt, and this problem was resolved when the variable *any mental health diagnosis* was disaggregated into specific diagnostic categories. The omnibus chi-square and Hosmer and Lemeshow tests of model fit were also used to determine if the overall logit model fit the data. In determining good model fit, the larger the non-significance level of the Hosmer Lemeshow test, the better the fit.

Logit models with suicide ideation as dependent variable. The first logit model was developed by including the four study variables that research and theory suggest are the strongest predictors of suicide behavior: *any mental health diagnosis*, *substance abuse problems*, *chronic pain*, and *chronic homelessness (homeless 1 year or more)*. As shown in Table 23, only mental health diagnosis showed a statistically significant relationship to suicide ideation. Chronic pain was associated with ideation at a trend level (.05 to .10). The model omnibus chi-square ($\chi^2 = 15.46, p < .004$) and Hosmer and Lemeshow ($\chi^2 = 5.15, p < .525$) tests of model fit indicated that the model fit the data well.

Table 23

Simple Logistic Regression Analysis for Selected Variables Associated with Suicide

Ideation

Independent Variable	B	SE	OR	Wald	Significance
Any Mental Health Diagnosis	1.07	.38	2.93	7.98	.005**
Chronic Pain	.58	.31	1.78	3.41	.06
Substance Abuse Problem	.42	.33	1.52	1.60	.21
Chronic Homelessness	.12	.31	.89	.14	.71

Notes: B = unstandardized beta. SE = standard error. OR = odds ratio. ** $p < .01$.

The second logit analysis (see Table 24) designed to model suicide ideation includes a disaggregation of the *any mental health diagnosis* variable into specific disorders: depression, bipolar (mania), schizophrenia, and anxiety (only eight participants reported PTSD, therefore it was merged with anxiety disorders). Chronic pain was left in the model because it was at a trend level in the previous model. The variables of *substance abuse problem* and *chronic pain* were left out of this model because of the lack of statistical association with suicide ideation in the previous model. Gender, race, and age were entered into step 1 of the logit model as control variables. In addition, chronic pain was entered into step 2 of the model, and the various mental health disorders were entered into step 3. Entering chronic pain into step 2 and the mental health disorders in step 3 reflects the hypothesis that the specific mental health disorders will demonstrate a

stronger relationship, beyond chronic pain, to suicide ideation. A logit model reversing steps 2 and 3 is presented in Table 25, and then the models are compared.

Table 24

Logistic Regression Analysis for Selected Variables Associated with Suicide Ideation
(Controlling for Chronic Pain)

Independent Variable	B	SE	OR	Wald	Significance
Step 1					
Gender	.47	.29	1.59	2.55	.11
Race	.15	.28	1.16	.28	.60
Age	.35	.28	.71	1.55	.21
Step 2					
Chronic Pain	.75	.33	2.11	5.22	.024*
Step 3					
Schizophrenia	1.63	.52	5.08	9.75	.002**
Anxiety DX	.76	.56	2.15	1.84	.18
Depressive DX	1.17	.44	3.20	7.04	.008**
Bipolar (Mania)	1.44	.47	4.23	9.32	.002**

Notes: B = unstandardized beta. SE = standard error. OR = odds ratio. * $p < .05$. ** $p < .01$.

Table 25

Logistic Regression Analysis for Selected Variables Associated with Suicide Ideation
(Controlling for Mental Health Disorder)

Independent Variable	B	SE	OR	Wald	Significance
Step 1					
Gender	.47	.29	1.59	2.55	.11
Race	.15	.28	1.16	.28	.60
Age	.35	.28	.71	1.55	.21
Step 2					
Schizophrenia	1.50	.52	4.47	8.39	.004**
Anxiety DX	.73	.56	2.07	1.70	.19
Depressive DX	1.15	.44	3.17	7.02	.008**
Bipolar (Mania)	1.37	.47	3.95	8.54	.003**
Step 3					
Chronic Pain	.75	.33	2.11	5.22	.022*

Notes: B = unstandardized beta. SE = standard error. OR = odds ratio. * $p < .05$. ** $p < .01$.

The logit models illustrated in Tables 24 and 25, show that when age, race, and gender were controlled for, schizophrenia, bipolar (mania), depression, and chronic pain had significant partial effects on suicide ideation. Schizophrenia and bipolar (mania) showed the strongest association with suicide ideation. The omnibus chi-square test of

model fit indicated that the logit model in Table 24 fit the data well ($\chi^2 = 23.95$, $p < .002$). The Hosmer and Lemeshow model fit test indicated an acceptable fit ($\chi^2 = 15.126$, $p < .057$). The logit model shown in Table 24 had an omnibus chi-square of $\chi^2 = 24.93$ ($p < .003$) and a Hosmer Lemeshow test of $\chi^2 = 12.45$ ($p < .132$). In addition, the logit model displayed in Table 25 demonstrated that when chronic pain is entered after the mental health disorders, the association between chronic pain and suicide ideation increases slightly. The model in Table 25 appears to fit the data better than the logit model in Table 24.

Logit models with suicide attempt as dependent variable. A simple logistic regression model was conducted to determine which selected study variables show the strongest relationship to suicide attempt. The same independent variables used to explain suicide ideation were used in the logit models designed to explain suicide attempt: *any mental health diagnosis*, *substance abuse problem*, *chronic homelessness* and *chronic pain* were loaded into a logistic regression. As shown in Table 26, only *any mental health diagnosis* was statistically significant in relating to suicide attempt. A closer examination of the variables in this model indicated that *substance abuse problem* and *any mental health diagnosis* were inter-related. In fact, 40 of the 48 reported of suicide attempts involved both substance abuse problems and a mental health diagnosis of some sort (see Table 27). This problem was addressed by using the specific mental health disorders as independent variables instead of the *any mental health diagnosis* variable.

Table 26

Simple Logistic Regression Analysis for Selected Variables Associated with Suicide

Attempt

Independent Variable	B	<i>SE</i>	<i>OR</i>	Wald	Significance
Any Mental Health Diagnosis	2.73	1.03	15.31	7.06	.008**
Chronic Pain	.12	.37	1.12	.10	.75
Substance Abuse Problem	.71	.45	2.03	2.41	.12
Chronic Homelessness	.02	.37	1.02	.01	.95

Notes: B = unstandardized beta. *SE* = standard error. *OR* = odds ratio. ** $p < .01$.

Table 27

Interaction Between Substance Abuse Problem and Any Mental Health Diagnosis as Related to Suicide Attempt ($\chi^2 = 15.895, p = .001$)

	No Suicide Attempt (n)	Suicide Attempt (n)	Total
No Mental Health Diagnosis and No Substance Abuse Problem	19	0	19
Mental Health Diagnosis Only	33	7	40
Substance Abuse Problem Only	28	1	29
Mental Health Diagnosis and Substance Abuse Problem	98	40	138
Total	178	48	226

The next step in modeling suicide attempt was to refine the simple logit model by adding control variables and disaggregating the variable *any mental health diagnosis* into specific mental health diagnosis variables. In addition, the variables *chronic pain* and *chronic homelessness* were removed from the analysis because of the lack of statistical association. The variable *substance abuse problem* was included in the refined model because it showed to be related at a statistically significant level in bivariate analyses and it strongly related to the variable *any mental health diagnosis*. As illustrated in Table 28, when age, race, and gender are controlled for, the mental health disorders of schizophrenia, bipolar (mania), depression, and anxiety had significant partial effects on

suicide ideation. Schizophrenia and bipolar (mania) showed the strongest association with suicide ideation. Substance abuse problems, when modeled with the specific mental health disorder variables, was not associated with a suicide attempt at a statistically significant level. The omnibus chi-square test ($\chi^2 = 33.238, p < .000$) and the Hosmer and Lemeshow test ($\chi^2 = 5.98, p < .650$) showed that the model fit the data well.

Table 28

Logistic Regression Analysis for Selected Variables Associated with Suicide Attempt

Independent Variable	B	SE	OR	Wald	Significance
Step 1					
Gender	.55	.36	1.74	2.32	.13
Race	.18	.33	.84	.28	.60
Age	.55	.34	.58	2.58	.11
Step 2					
Schizophrenia	3.03	1.09	20.79	7.77	.005**
Anxiety DX	3.00	1.12	20.15	7.18	.007**
Depressive DX	2.18	1.08	8.81	4.09	.043*
Bipolar (Mania)	3.38	1.07	29.39	9.99	.002**
Substance Abuse Problem	.62	.47	1.85	1.75	.19

Notes: B = unstandardized beta. SE = standard error. OR = odds ratio. * $p < .05$. ** $p < .01$.

In summary, results show that this sample of PHI reported thoughts and attempt of suicide more frequently than the general population. Mental health disorder was associated with suicide ideation and attempt. Substance abuse problems was associated with suicide attempt at the bi-variate level, but were not associated with suicide attempt when the specific mental health disorder was added into the equation. Chronic pain was associated with suicide ideation but not suicide attempt. Chronic homelessness, age, gender, race, and age when first homeless were not associated with suicide thoughts or attempt.

CONCLUSIONS, DISCUSSION, AND IMPLICATIONS

A. Conclusions and Discussion

Overall, the findings partially support the research hypotheses. The percentage of study participants reporting suicide ideation and attempt was much higher than that reported by the general population. When asked about having suicidal thoughts and making a suicide attempt two month prior to entry into PSH, 43% of the study sample reported suicide ideation and 21% a suicide attempt. Suicide studies using U.S. general population samples yielded a lifetime prevalence rate of suicide ideation between 6% and 16% and a lifetime prevalence rate of suicide attempt between 2% and 5% (Baca-Garcia et al., 2010; Weissman, 1999).

Previous studies on suicide among the homeless have asked about suicide attempt and ideation over the lifetime and during the last 30 days (Desai et al., 2003; Prigerson et al., 2003). When comparing results from studies asking about lifetime prevalence of attempt and ideation to the current study, the lifetime rates for ideation and attempt were much higher (attempt: 28% - 57%; ideation: 56% - 78%) than the current study. The rate of suicide ideation and attempt in studies inquiring about the last 30 days was 8% for attempt and 38% for ideation. Considering the timeframe queried, the suicide ideation and attempt rates reported from previous studies are comparable to the current study's results.

In regards to the second hypothesis, which is related to factors associated with suicide ideation and attempt, self-reported mental health disorder bore the strongest association with suicide ideation and attempt. Specifically, self reported schizophrenia, depressive disorders, and bipolar (mania) were associated with suicide ideation, whereas self-reported schizophrenia, depressive disorders, bipolar (mania), and anxiety disorders were associated with suicide attempt. Similarly, previous studies on suicide among the homeless have found that mental health disorder, specifically mood and thought disorders, most strongly predicts suicide ideation and attempt (Desai et al., 2003; Enyan et al., 2002). In addition, studies with non-homeless, un-medicated individuals diagnosed with bi-polar or schizophrenia have shown very high rates of suicide attempts (Perlis et al., 2007; Pompili et al., 2009). In the current study, the odds ratio of attempting suicide and carrying a diagnosis of bipolar (mania) or schizophrenia was much higher than previous studies. More than likely this was due to the small number of attempts ($n = 48$) in the current study and the disproportionate number of individuals reporting schizophrenia or bipolar (mania). Also, individuals self reporting schizophrenia or bi-polar (mania) may have been non-complaint in taking psychotropic medications, thus increasing their risk of suicide ideation or attempt.

A substance abuse problem was associated at a statistically significant level with suicide attempt at the bivariate level but did not remain statistically significant when specific mental health disorders were factored in. However, participants who reported both a mental health disorder and a substance abuse problem were more likely to report a suicide attempt compared to participants who reported only a mental health disorder or only a substance abuse problem. Further, substance abuse problems did not represent a

statistically significant number of participants reporting suicide ideation. In contrast to a previous study (Prigerson, 2003) examining homelessness, substance use disorders, and suicide, the current study did not find that substance abuse problems differed as a function of age and explained suicide ideation and attempt above and beyond mental illness. One possible explanation for these differences in findings is that the current study involved far fewer participants ($N = 226$) than the study in question (over 5,000). The smaller sample size may have made it difficult to capture the effect substance abuse had on suicide ideation and attempt as a function of a specific age category.

Chronic pain represented an association with suicide ideation even when controlling for mental health disorder, race, age, and gender. In contrast, chronic pain was not related to suicide attempt at a statistically significant level. No other self-reported physical health condition was associated with an increased likelihood of suicide ideation or attempt. Previous studies with the general population have found a strong association between chronic pain and suicide ideation (Ilgen et al., 2008).

There was no statistically significant relationship between race (White/Non-White), gender, age (above or below median age), or greater amounts of homelessness (4 or more episodes; a year or longer) and suicide ideation and attempt. Previous studies examining suicide ideation and attempt among the homeless have yielded gender and age differences in the amount of suicide ideation and attempt reported (Desai et al., 2003; Enyan et al., 2003; Prigerson et al., 2003). These studies have all found that females report suicide ideation and attempt at a much higher rate than males. Previous studies had much larger samples, which may have made the detection of age, race, and gender differences more feasible. In addition, previous homeless studies, unlike the current

study, had a disproportionate number of female participants. Further, it is plausible that individuals who received PSH had uniquely similar trajectories and experiences that transcended gender. For example, it has been found that hopelessness is a strong predictor of suicide, regardless of gender (Beck et al., 2006). Perhaps hopelessness, which was not measured in this study, was influential in determining who reported suicide ideation and attempt.

In the studies examining suicide among the homeless, it has been found that more episodes of homelessness and/or longer time spent homeless are associated with more suicide ideation and attempt (Desai et al., 2003; Enyan et al., 2003; Prigerson et al., 2003). In the current study, more homelessness was not associated with elevated levels of suicide ideation and attempt. The reason the current study did not find an association between chronic homeless or more days spent homeless and suicide ideation and attempt may lie in the composition of the sample. Previous studies drew from samples of chronic shelter dwellers or chronic mentally ill individuals who had been receiving assertive community treatment for their chronic conditions. Sampling from this population will naturally load the sample with a large number of homeless individuals who have been homeless for a longer duration and not equally represent homeless individuals who have been homeless for shorter stints. The current study was able to draw from a sample of PHI who represented a broad continuum of time spent homeless.

B. Study Strengths and Limitations

1. Study strengths

The data for this study represents current and original information on homeless outcomes. The ability to identify and complete interviews with over 200 PHI is a strong

point of this study considering the many challenges previous researchers have had in collecting data on the homeless (Burt 1999; Culhane 2008). Previous research on suicide and homelessness has relied on one or two older data sets to test research hypotheses regarding suicide (Desai et al., 2003; Prigerson et al., 2003). The current study includes individuals who had been homeless as few as two days to over ten years. In contrast, previous studies have relied on samples that include a disproportionate amount of chronic homeless individuals (Desai et al., 2003; Enyan et al., 2002; Prigerson et al., 2003). Collecting data from individuals who have been homeless for varying lengths of time allowed for the accurate analysis of how length of homelessness influences suicide ideation and attempt. In addition, the current sample did not target a chronic mentally ill homeless population as previous studies have (Desai et al., 2003; Prigerson et al., 2003). The homeless individuals surveyed for the current study did not have to meet criteria for a chronic mental illness. Therefore, it was possible to observe how mental illness was associated with suicide ideation and attempt in a sample of homeless individuals not predetermined to be severely mentally ill.

In contrast to the majority of research on homelessness and suicide, the current study employed a theoretical framework to drive study hypotheses and model data. The risk amplification theory offered a guide and justification for which independent variables to include and how to explain the results. The inclusion of a theory provides a template for other researchers to understand and build upon the findings.

2. Study Limitations

Despite the multiple strengths of the current study, it possesses several limitations. The study relied on data not specifically designed to answer hypotheses

regarding suicide. The study employed a cross-sectional and retrospective design. Hence, causality, temporality and directionality of study variables (i.e. mental illness, chronic pain, homelessness, and suicide) cannot be determined. Also, participants were asked to recall experiences, conditions, and emotional states in the past (i.e., suicide ideation and attempt; mental health, physical health, substance abuse problems). Inquiring about past experiences calls into question the accuracy of memory recall.

Standardized measures to assess for mental health, physical health, and substance use disorders were not employed in this study. Rather, study participant report was relied upon to determine the existence and type of mental health disorder, including substance abuse problems; and physical health problems. Though other homeless researchers have relied upon participant report of mental health and substance abuse disorders (Burt 1999; Wong et al., 2006), and have suggested it is reliable (Bonin, Fournier, Blais, Perreault, & White, 2007), the use of a psychiatric diagnostic interview is preferred. Unfortunately, it was not feasible within the constraints of the primary research study (cost effectiveness of permanent supportive housing) to include a psychiatric diagnostic interview. Adding a psychiatric diagnostic interview would have added approximately two hours to the existing two-hour survey. In addition, it was not feasible to train and supervise masters' level clinicians to administer the interviews. In lieu of administering the diagnostic interview, every attempt was made to ask research participants to provide documentation of their diagnosis. This occurred quite frequently because individuals receiving PSH commonly receive a psychiatric evaluation and med check; thus, paperwork with psychiatric diagnoses was readily available. Further attempts to confirm the diagnoses

were made through obtaining state Medicaid data, but this only yielded a few psychiatric diagnoses on a few participants.

As with other studies involving homeless individuals, it was not possible to obtain a complete representation of all homeless individuals. The current study relied on individuals who were receiving PSH. Thus, study results cannot be generalized to all homeless individuals. For instance, homeless individuals living under a bridge or in a cardboard box at the time of the interview may have given different answers to the survey than those homeless individuals being interviewed while residing in PSH.

Researchers investigating suicide behavior must commonly rely on self-report measures of attempt and ideation in that there are no accurate or acceptable substitutes (Desai et al., 2003; Fitzpatrick et al., 2007; Prigerson et al., 2003). Obtaining collateral information from another source (e.g., family/friend report, medical records) must also rely on the accuracy and candor of the person who is contemplating suicide. Researchers have used medical records to supplement self-reports of suicide attempt, but the availability of this data is limited by medical providers' willingness to disclose this information and is contingent upon the suicide attempt being brought to the attention of a physician (Arnold et al., 2003). Self-reported data has limitations, including underreporting if respondents are not comfortable sharing personal information, lack trust in the interviewer, fear that disclosure may lead to disqualification from services, or have simply forgotten relevant information. Self-report may also lead to over-reporting of phenomena if subjects' recollections are flawed or they believe there are secondary gains (such as enhanced services or resources) associated with a particular state or condition. However, self-report data has been shown to be a reliable method in measuring suicide

ideation among the general population (Kessler et al., 1994; Kessler et al., 2005; Weismann et al., 1999) and in measuring outcomes among the homeless (Burt et al., 1999; Calsyn et al., 1993; Wong et al., 2006).

3. *Implications*

Research Implications. The current study is a small addition to a research literature that requires further investigation. Findings from the present study corroborate past results that have shown mental health disorder to be a major risk factor for suicide behavior among the homeless. Additional research employing a longitudinal, repeated-measures design would be ideal in tracking psychiatric trajectories, including suicide, over time to determine the temporality and directionality of mental health disorder and suicide. Longitudinal studies would also assist with understanding how other life events, medical conditions, and the worsening or improvement of mental health symptoms affect the incidence of suicide behavior. Further, the use of measurements that include suicide-specific measures (SIQ, Sit-B) and psychiatric diagnostic interviews tailored for the homeless population will provide much-needed rigor and detail in understanding mental illness and suicide among the homeless. In addition, including measures that assess past trauma, hopelessness, impulsivity, and substance abuse would provide for a more comprehensive evaluation of suicide risk factors. Clearly, there are many challenges (discussed elsewhere in the paper) in conducting a longitudinal study with homeless individuals. However, previous studies have been successful with the chronic mentally ill and other hard-to-track populations.

The finding that chronic pain may be associated with suicide ideation among the homeless strengthens the need for understanding of how the condition of homelessness

affects the mind, body, and spirit. It is curious what exactly “chronic pain” is capturing and hopefully additional investigation will seek further explanation. One hypothesis is that the chronic pain represents a proxy measure for the multidimensional and deep level of despair and hopelessness that some homeless individuals may experience.

Hopelessness may manifest itself in physical pain. There also may be a more concrete explanation: Homeless individuals may be exposed to conditions that create more physical pain. Consistent with the risk amplification theory, the condition of homelessness may exacerbate existing physical health symptoms, including symptoms that involve physical pain, which in turn may increase hopelessness and suicidal thoughts. More research is needed to ascertain the role pain plays in predicting suicide ideation.

The current study findings underscore the need to derive a sample of homeless individuals that represent a variety of homeless dispositions (e.g., shelters, living on the streets, soup kitchens) and lengths of homelessness. The present study introduces the idea that perhaps regardless of the number of episodes or length of homelessness, being without shelter, even for one night, can be very distressing and demoralizing. Longitudinal research is needed to track the relationship between the amount of homelessness and the suicide ideation and attempt.

Eventually, intervention studies are needed to test what type of programs and initiatives reduce suicide behavior among the homeless. Interventions that target the structural, physical, and psychological needs of homeless individuals are desperately needed. The current study, though not designed to measure its effectiveness, points at PSH as a possible intervention that may reduce suicide behavior among the homeless.

The current study found that suicide ideation and attempt decreased following the entry into PSH. However, much more data is needed to understand the directionality, temporality, and mechanisms involved regarding the effect PSH has on suicide.

Practice Implications. Considering the high rate of suicide among the homeless, practitioners working in social service agencies such as shelters, day treatment programs, community treatment teams, and community mental health centers need to be educated about the need to assess for suicide during the initial screening process. Study results point out that regardless of the time spent homeless, the experience of being without shelter, even for one day, can be extremely distressing and disruptive. Assessment of suicide should be a part of assessing homeless individuals, regardless of the length of time spent homeless.

Further, the study data supports the practice of assessing for mental health disorders, especially schizophrenia, bipolar (mania), anxiety, and depression. The general population research on suicide is very clear in demonstrating the strong connection between depression and suicide. However, in this study, schizophrenia and bipolar disorder seem to be particularly associated with suicide. Clinicians working with homeless individuals should be trained in assessing for mental health disorders or refer the homeless individual to a clinician who can assess for mental health problems. More specifically, it is important to understand the nature of the suicidal thoughts. Dysfunctional and negative thoughts that are associated with anxiety and depressive disorders are usually treated differently than suicidal thoughts that may be a function of a hallucination or delusion. Command hallucinations and delusions are common symptoms of schizophrenia and may present as symptoms of mania. If the suicidal

thoughts or behaviors are manifestations of hallucinations and delusions, inpatient psychiatric care and medication is highly recommended. Conversely, negative or dysfunctional thinking may warrant a different treatment approach, involving outpatient care which involves psychotherapy and medication.

The current study was not designed to assess for dual disorders, though the bivariate results indicate a strong dual relationship between substance abuse problems and mental health problems and the report of suicide attempt. Research conducted on clinical and general adult populations has shown a strong link between the co-occurrence of substance abuse problems and mental health disorders and suicide behavior. It is believed that some individuals who suffer from mental illness use substances to self-medicate or cope with the symptoms of mental illness. In turn, the substance use lowers human inhibitions, increases impulsivity and pain tolerance, and results in an increased risk of suicide behavior. Therefore, it is important for social workers to assess for the co-occurrence of substance abuse and mental health disorders.

The current findings highlight the need to assess for the presence and severity of pain homeless individuals experience. Not all homeless individuals end up at the hospital where a pain assessment is routinely made. Outreach workers, social workers, shelter workers, and homeless service providers should consider adding a pain assessment to their assessment procedures, particularly because the experience of pain may indicate that a person may be at a higher risk of suicidal thoughts. Assessing for and addressing pain issues may be an effective way to prevent the escalation of suicidal thoughts and behavior.

Another area on which clinicians should focus prevention efforts is the method of suicide attempt homeless individuals use. Most suicide prevention strategies involve the assessment and removal of pills, guns, knives, alcohol, drugs, and razors. Not surprisingly, the most reported method of suicide attempt in the current study was overdose of pills. Overdosing on pills is the most commonly used method among adult clinical and general populations. Unexpectedly, the second most common method of suicide attempt reported by this study sample was stepping in front of a train/car. Upon further reflection, stepping in front of a car/train makes sense from an environmental standpoint. Many homeless individuals are living on the streets, sleeping on sidewalks or near railroad tracks. Among the general population, it is common to use methods that are readily accessible. For a homeless person, an oncoming car or train is what may be readily accessible. It is more challenging to develop a prevention plan to rid a homeless person's environment of cars and trains than it is to rid their environment of pills and firearms. However, the assessment of substance use is important. Substance abuse impairs judgment and may increase the likelihood of walking in front of a car or train. Also, educating homeless individuals about sleeping in safer areas and seeking indoor shelter in the evening is important.

Though the focus of the study was on understanding risk factors associated with suicide ideation and attempt, I learned about many of the participants' strengths and was inspired by their stories of resilience and perseverance. I was reminded that the assessment of client strengths is an important tool that should not be forgotten. As difficult as it may be, measuring how a homeless individual survives from day to day may uncover keys to preventing future suicide behavior. For example, how do some

homeless individuals stay hopeful and convinced that things will get better? Learning and tapping this resilience is a very important aspect of working with homeless individuals. Using the results of a strengths assessment can help social workers and others design a suicide prevention plan that offers reasons for living and lists internal and external strengths that can be used to combat feelings of hopelessness.

4. Next Steps

In addition to the need for longitudinal and intervention studies, further application, development, and testing of theories explaining suicide among the homeless is needed. The risk amplification theory used in the current study was useful in developing study hypotheses and interpreting study results, but the theory itself was not statistically tested. Future research could design a study, perhaps using SEM, to measure how the conditions of homelessness exacerbate existing problems (e.g., mental illness), which in turn increases risk for suicide. Further, other theories could be used to drive and construct studies on suicide among the homeless. For example, labeling theory could inform the measurement of societal stigma and posit how stigma and discrimination operate as possible risk factors for suicide. Cognitive theory could help guide the investigation of how dysfunctional, hopelessness-related thinking interacts with other risk factors to increase a homeless individual's risk for suicide.

It seems that Joiner's (2005) interpersonal theory of suicide would be a good theory to apply and test on a sample of homeless individuals. According to Joiner's theory (2005), thwarted belongingness, perceived burdensomeness, and exposure to painful and provocative events must all occur for a person to become suicidal. Many of the homeless individuals interviewed for the current study talked about how they see

themselves as a burden to society and not wanted; others discussed how they felt like outcasts and had no choice but to live a reclusive life. This construct of Joiner's theory incorporates some of the tenets of social capital theory. As indicated by results from the current study and information gleaned from the open-ended part of the interview for this study, homeless individuals are on the receiving end of many painful experiences and events. These events and experiences can manifest in physical, psychological, and spiritual pain. However, one major limitation to Joiner's theory is that it appears to focus on the individual's perspective and not account for how societal perceptions, norms, and policies influence the individual's behavior. A dimension that includes societal stigma and discrimination would need to be added to Joiner's model to better frame why homeless individuals contemplate and attempt suicide.

APPENDIX A

Cost Effectiveness of PSH in North Carolina Project

The purpose of this project is to assess the cost effectiveness of PSH in North Carolina. This analysis is being conducted over multiple years. During the first year of this effort, case studies were developed that described PSH initiatives in three communities across the state. These case studies were developed after project staff met and interviewed officials and stakeholders involved with those efforts. Also, as part of the first year's activities, a survey instrument was developed to collect information on the experiences of individuals living in PSH.

During the second year of this project, that survey instrument will be used to conduct interviews with residents living in PSH. These residents will be asked about their experiences before and after entry to PSH and to authorize agencies and organizations that provided services to them from two years before entering PSH to the present to release information on the costs of those services. After conducting the interviews, project staff will contact these agencies and organizations and request information on the costs of providing services to those individuals. Project staff also will track the cost of services after the individuals entered PSH.

This research is supported by the North Carolina Interagency Council for Coordinating Homeless Programs (ICCHP). The ICCHP was created by executive order in 1992. One of its primary missions is to "advise the Governor and the Secretary of the Department of Health and Human Services related to the problems of person who are homeless or at risk of being homeless ...and provide recommendations for joint

cooperative efforts and policy initiatives in carrying out programs to meet the needs of the homeless.” This analysis of community based PSH will assist NC ICCHP in meeting its mission.

PSH is designed to provide services to homeless individuals efficiently and effectively. Many of the individuals who live in PSH suffer from serious mental illness (SMI) and also have a history of substance abuse. In the PSH environment, services are provided to these individuals to permit them to live independently. These services provide an array of supports including treatment for medical conditions. Other services may include such things as referral for Medicaid, employment and training services, or referral and assistance in applying for Social Security disability or Supplemental Security Income.

Through assertive case management in PSH, the cost of providing services is reduced. For example, by managing an individual’s health care needs, the individual’s total medical cost is reduced. This reduction in health care cost is obtained through a greater reliance on primary care providers instead of obtaining treatment through hospital emergency rooms. Through the use of primary care, an individual’s condition can be stabilized reducing the need for emergency treatments. The assertive case management may result in an individual taking all required medications and remaining on an appropriate diet.

In addition to health care, PSH can result in other costs saving to the community. These savings are achieved through such things as reduced contact with police and other law enforcement, subsequent savings in court and jail costs, and reductions in fire department, emergency medical personnel, and ambulance expenses. PSH also may result

in a reduction in the costs of providing mental health services delivered within the community or through state of Veteran's Administration hospitals.

Purpose

The purpose of this project is to analyze and assess the cost effectiveness of PSH projects in three communities across the state. This analysis will be used to inform policy makers in state and local government and will assist ICCHP in pursuing its mission. The analysis will guide local stakeholders in determining whether to develop PSH as a means to provide shelter and services to homeless individuals in their community. The analysis also will be used to provide information to legislators and county commissioners on how PSH can affect the costs of services.

Scope

The key activities of this phase of the project involve collecting information from residents of PSH units in order to track the cost of providing services to them both before and after their entry into the facility. Attempts will be made to track the costs of services for these individuals for a two-year period before and a two-year period after their entry to PSH. The costs incurred for these two time periods will be analyzed and compared in order to determine the impact of these facilities on the costs to the homeless service delivery system.

After the individuals in PSH are informed of the study, project staff will contact them and invite them to participate. Depending on the facilities and the preferences of the staff who deliver services to the residents, the study may be introduced in a group meeting with residents. After that meeting, each resident will be contacted and asked to participate by a member of the Jordan Institute for Families research team. The PSH

residents will be provided an incentive payment for meeting with the research team member to discuss the study. The resident will not have to participate in the study in order to receive an incentive payment.

If the resident agrees to participate, the research team member will administer the questionnaire developed under the first phase of the project. The questionnaire is designed to collect information about the resident's experiences before and after entry to PSH. Information will be requested on the types of services the individual received during each time period, as well as whether those services were delivered in the county where they are currently living or in some other location. These services include treatment at emergency rooms, hospitalizations, and commitment to a state mental hospital. Information also will be collected on whether the resident was arrested and imprisoned before or after entering PSH.

This information will be used to guide the collection of cost data in each locality. As part of the interview process, individuals will be requested to sign and initial a release of information form. This form will be used to request cost data from homeless service provider and other agencies and organizations. The form is designed to comply with the requirements of the Health Insurance Portability and Accountability Act (HIPAA). Data on the cost of services provided to each resident who is interviewed and signs a release form will be requested from the housing provider, the supportive services providers, the local assertive community treatment team, local hospitals, health care providers that provide services to homeless individuals, state hospitals, local police and sheriff's departments, local emergency medical service providers, as well as other agencies,

organizations, and entities who may have provided services to the individual before and after entry to PSH.

The cost data will be accumulated and tracked for each individual. Costs will be analyzed to observe patterns of expenditures across study participants over time. Based on previous research, it is likely that a small number of individuals in the PSH programs account for a large amount of the total costs. Some individuals may have had negligible service costs in the two years before entry to PSH while others may have had extremely high costs. The analysis will examine these patterns in service utilization.

APPENDIX B

Data Collection Instrument

Analysis of the Cost Effectiveness of Supportive Housing for Homeless Persons

Demographic Information

Which of these best describes you?

Male

Female

Transgender

Other (how do you describe yourself?) _____

When were you born?

Date of Birth: ____ / ____ / ____

Month Day Year

Don't know

Refused

In terms of race or ethnicity, how do you describe yourself? (check all that apply)

Native Hawaiian or other Pacific Islander

American Indian or Alaskan Native

Asian

Hispanic/Latino/Mexican

White

Black or African American

Other (how do you describe yourself?):

Don't know

Refused

Current Situation: Employment, Benefits

Are you currently working?

Yes

No

NR/Refused

(If working)

Type of job _____ Hours/week _____ Earnings/month _____

(If not working)

Are you currently looking for a job?

Yes

No

NR/Refused

Do you receive any government benefits (SSI, SSDI, VA benefits, pension, Food Stamps, or other)?

Yes

No

NR/Refused

(If yes)

Type of benefit: _____ Amount per month: _____

Type of benefit: _____ Amount per month: _____

Type of benefit: _____ Amount per month: _____

Do you have Section 8 or other housing assistance?

Yes

No

NR/Refused

(If yes)

Type of benefit: _____

Amount per month: _____

Did you ever serve in the military?

Yes

No

NR/Refused

(If yes)

Did you serve in (check all that apply):

World War II

Korean War

Vietnam

First Gulf War

Iraqi Freedom

Which of the following types of medical insurance do you currently receive?

Medicaid

Medicare

VA medical benefits

Private insurance

No insurance

History of Homelessness

How many times in your life have you been homeless or without regular housing?

Number of times _____

Don't know

NR/Refused

How old were you the first time you were homeless or without regular housing?

Age in years _____

Don't know

NR/Refused

How long were you homeless or without regular housing most recently?

Number of days _____

Don't know

NR/Refused

As a child or youth, were you ever in foster care?

Yes

No

NR/Refused

(If yes)

Number of years in foster care _____ Age when exited foster care _____

Don't know

NR/Refused

Current Status: Health

The next questions are personal and may be sensitive to answer. Please remember, all of your answers are confidential. If you don't want to answer a question, let me know and we'll skip it.

Do you have any major physical illnesses or conditions?

Yes

No

NR/Refused

(If yes)

What illnesses or conditions?

Interviewer: Check most appropriate code:

Cardiovascular illness

Diabetes

Respiratory illness

Gastrointestinal illness

Hepatitis

Chronic pain

Do you take medications for the(se) illness(es) or condition(s)?

Yes

No

NR/Refused

Have you had problems with substance abuse (drugs or alcohol)?

Yes

No

NR/Refused

(If yes)

When did those problems begin? _____

Are you currently having problems with drinking or using drugs?

Yes

No

NR/Refused

Are you HIV positive or do you have AIDS?

Yes

No

NR/Refused

(If yes)

How long have you been HIV positive? _____

Are you currently receiving treatment?

Yes

No

NR/Refused

Have you had problems with mental health issues?

Yes

No

NR/Refused

(If yes)

When did you start having mental health problems? _____

Have you been diagnosed with a mental illness?

Yes

No

NR/Refused

(If yes)

Do you know your diagnosis(es)?

No

NR/Refused

Interviewer: Check most appropriate code:

Schizophrenia/schizoaffective disorder

Anxiety disorders

Depressive Disorder

Bipolar Disorder

PTSD

Do you take any psychiatric medications for your illness?

Yes

No

NR/Refused

I'd like to ask a bit more about any psychological or emotional problems you may have had, focusing on the past month. We'll read a list of experiences, and for each, you can let me know how often it has happened for you in the past month.

In the past month, how often have you...	Not At All	Once or Twice	Several Times in the Month	Several Times a Week	Every Day	DK	NR
Felt nervous, tense, worried, frustrated, afraid?							
Felt depressed?							
Felt lonely?							
Been told by other people that you acted "paranoid" or "suspicious"?							
Heard voices, or see or hear things that other people didn't think were there?							
Had trouble making up your mind, like deciding where you wanted to go, what you wanted to do, or how to solve a problem?							
Had trouble thinking straight, or concentrating on something you needed to do, or thinking about problems so much that you couldn't remember or focus on other things?							

In the past month, how often have you...	Not At All	Once or Twice	Several Times in the Month	Several Times a Week	Every Day	DK	NR
Felt that your behavior or actions were strange or different from those of other people?							
Felt out of place or like you didn't fit in?							
Forgotten important things?							
Had problems with thinking too fast or having racing thoughts?							
Felt suspicious or paranoid?							

Open-ended questions

I'd like to learn about your situation before you started living here. This last time that you were homeless, right before you came into this program (permanent supportive housing program), what was your life like? (probe for clarification, use statements like "can you tell me more", "or like what").

What has your experience been like living here and receiving support from this program (activities, reactions, positive or negative feelings)?

I'd like to ask a few more questions about how you feel about your current housing situation.

How satisfied are you with...	Very Unsatisfied	Unsatisfied	Neutral	Satisfied	Very Satisfied
The amount of choice you had over your current housing situation?					
How close you live to family and friends?					
How close you live to needed services (health, mental health, etc)?					
The amount of choice you have about when to see your case manager?					
The amount of choice you have about whether or not to take medication?					
How close you live to shopping, transportation, the post office, etc.?					
The amount of control you have over who enters your home?					
The safety of your neighborhood?					
The amount of privacy you have?					
How affordable your home is?					
The time it takes to get home repairs done?					

How satisfied are you with...	Very Unsatisfied	Unsatisfied	Neutral	Satisfied	Very Satisfied
The condition (repair) of your home?					
The safety and security of your building?					
How close you live to recreational activities, movies, places of worship, etc.?					
The amount of independence that you have in your daily life?					
The opportunities that you have to socialize in or around your home?					
How easy it is to contact your case manager if you need to?					
The amount of choice you have about whether or not to see your case manager?					

Quality of Life Pre- and Post- Supportive Housing

I'd like to think now about the few months ***before*** you started living here (when you were last homeless), and compare them to the time ***since*** you started living here. I'd like to learn about some of your experiences during those times.

<u>Before</u> you started living here...		<u>Since</u> you have been living here...	
Did you have enough clothing and food?	Never Rarely Sometimes Usually Always	Do you have enough clothing and food?	Never Rarely Sometimes Usually Always
Did you feel physically healthy?	Never Rarely Sometimes Usually Always	Do you feel physically healthy?	Never Rarely Sometimes Usually Always
Did you feel emotionally healthy?	Never Rarely Sometimes Usually Always	Do you feel emotionally healthy?	Never Rarely Sometimes Usually Always
Did you think about killing yourself?	Yes No	Do you think about killing yourself?	Yes No
Did you make a suicide attempt? How?	Yes No	Have you made a suicide attempt? How?	Yes No
Did you feel that you had friends?	Never Rarely Sometimes Usually Always	Do you feel that you have friends?	Never Rarely Sometimes Usually Always

<u>Before</u> you started living here...		<u>Since</u> you have been living here...	
Did you feel that you had people who you could turn to for help if you needed it?	Never Rarely Sometimes Usually Always	Do you feel that you have people who you can turn to for help if you need it?	Never Rarely Sometimes Usually Always
Did you feel like you had a community that supported you?	Never Rarely Sometimes Usually Always	Do you feel like you have a community that supports you?	Never Rarely Sometimes Usually Always
Were you able to do things that you enjoyed, either by yourself or with other people?	Never Rarely Sometimes Usually Always	Are you able to do things that you enjoy, either by yourself or with other people?	Never Rarely Sometimes Usually Always
Did you believe that you would be able to live successfully on your own?	Never Rarely Sometimes Usually Always	Do you believe that you are able to live successfully on your own?	Never Rarely Sometimes Usually Always
Did you believe that you could do what was needed to make things better for yourself?	Never Rarely Sometimes Usually Always	Do you believe that you can do what is needed to make things better for yourself?	Never Rarely Sometimes Usually Always
Did you feel happy with your life overall?	Never Rarely Sometimes Usually Always	Do you feel happy with your life overall?	Never Rarely Sometimes Usually Always

Pre-Supportive Housing Living Situations

Often, when people are without a regular place to live, they need to move around a lot.

I'd like to learn about some of the places that you stayed for the ***two years*** before you moved here. During those two years, did you spend any nights in any of the following?

An emergency or short-term shelter?

Yes

No

NR/Refused

(If yes)

Do you remember the name or the dates that you were there?

A transitional or longer-term shelter?

Yes

No

NR/Refused

(If yes)

Do you remember the name or the dates that you were there?

Your own house, apartment, or room?

Yes

No

NR/Refused

(If yes)

Do you remember the name or the dates that you were there?

A hotel, motel, or rooming house that you paid for yourself?

Yes

No

NR/Refused

(If yes)

Do you remember the name or the dates that you were there?

A hotel, motel, or rooming house that you paid for with a voucher or a pass?

Yes

No

NR/Refused

(If yes)

Do you remember the name or the dates that you were there?

A jail or prison?

Yes

No

NR/Refused

(If yes)

Do you remember the name or the dates that you were there?

A halfway house for people on probation or parole?

Yes

No

NR/Refused

(If yes)

Do you remember the name or the dates that you were there?

A facility where you could detox from drugs or alcohol?

Yes

No

NR/Refused

(If yes)

Do you remember the name or the dates that you were there?

A psychiatric hospital?

Yes

No

NR/Refused

(If yes)

Do you remember the name or the dates that you were there?

A VA Hospital?

Yes

No

NR/Refused

(If yes)

Do you remember the name or the dates that you were there?

Any other kind of hospital (like _____ (probe with local hospital))?

Yes

No

NR/Refused

(If yes)

Do you remember the name or the dates that you were there?

A nursing home or assisted living facility?

Yes

No

NR/Refused

(If yes)

Do you remember the name or the dates that you were there?

A residential recovery program?

Yes

No

NR/Refused

(If yes)

Do you remember the name or the dates that you were there?

A substance abuse halfway house?

Yes

No

NR/Refused

(If yes)

Do you remember the name or the dates that you were there?

An adult group home, crisis residence, or other housing for people dealing with mental illness?

Yes

No

NR/Refused

(If yes)

Do you remember the name or the dates that you were there?

An indoor public place, like a bus station, airport, subway station, or something similar?

Yes

No

NR/Refused

(If yes)

Do you remember the name or the dates that you were there?

Outside (on the street, in the park, in your car, in a campground, or something similar)?

Yes

No

NR/Refused

(If yes)

Do you remember the name or the dates that you were there?

Did you spend any nights in any other place that we haven't asked about?

Yes

No

NR/Refused

(If yes)

Do you remember the name or the dates that you were there?

Pre-Supportive Housing Services

Now, I'd like to learn about some of the services you received *during those same 2 years*.

Did you get food from a soup kitchen, food pantry, or food bank?

Yes

No

NR/Refused

(If yes)

Do you remember the name or the dates of those services?

Did an outreach worker or someone similar visit you to give you blankets or food, to see if you were okay, or to offer help?

Yes

No

NR/Refused

(If yes)

Do you remember the name or the dates of those services?

Did you go to a VA hospital or clinic, even if you didn't stay overnight?

Yes

No

NR/Refused

(If yes)

Do you remember the name or the dates of those services?

Did you go to a hospital emergency room or clinic, or an urgent care facility, even if you didn't stay overnight?

Yes

No

NR/Refused

(If yes)

Do you remember the name or the dates of those services?

Did you see a doctor or nurse in a shelter, soup kitchen, or other program?

Yes

No

NR/Refused

(If yes)

Do you remember the name or the dates of those services?

Did you visit a free or low cost clinic, or a Health Department clinic?

Yes

No

NR/Refused

(If yes)

Do you remember the name or the dates of those services?

Did you visit a private doctor's office?

Yes

No

NR/Refused

(If yes)

Do you remember the name or the dates of those services?

Did you receive any dental care?

Yes

No

NR/Refused

(If yes)

Do you remember the name or the dates of those services?

Did you receive outpatient counseling or therapy for mental health or substance abuse problems?

Yes

No

NR/Refused

(If yes)

Do you remember the name or the dates of those services?

Did you receive vocational or job training services?

Yes

No

NR/Refused

(If yes)

Do you remember the name or the dates of those services?

Did you receive case management services?

Yes

No

NR/Refused

(If yes)

Do you remember the name or the dates of those services?

Was there any other place that you visited, or any other services that you received, that I haven't mentioned?

Yes

No

NR/Refused

(If yes)

Do you remember the name or the dates of those services?

Different Cities of Residence

Often, when people are without a regular home, they find themselves living in many different cities or towns. During the **2 years** before you moved into the place where you are now living, what cities did you live in and when did you live there?

1.

2.

3.

In this (these) other location(s), did you ever spend time in or receive services from:

An emergency room or hospital?

Yes

No

NR/Refused

(If yes)

Do you remember the name or the dates of those services?

An outpatient medical clinic?

Yes

No

NR/Refused

(If yes)

Do you remember the name or the dates of those services?

A residential program for mental health or substance abuse issues?

Yes

No

NR/Refused

(If yes)

Do you remember the name or the dates of those services?

Outpatient counseling for mental health or substance abuse issues?

Yes

No

NR/Refused

(If yes)

Do you remember the name or the dates of those services?

Jail or prison?

Yes

No

NR/Refused

(If yes)

Do you remember the name or the dates that you were there?

Conclusion

Is there anything else that you would like to tell us about your experiences with homelessness and/or with supportive housing?

Thank you so much for your answers. As we discussed, I'd like to ask your permission to collect information from doctors, therapists, and others about the services you received and the cost of those services for the two years before you moved here. Remember, we will not identify you by name and we will not tell anyone about particular services that you received. Rather, we will add up all of the information that we get from everyone who takes part in our research and will report results for the whole group. Would you be willing to sign the attached form, giving us permission to collect this information?

Thank you so much for your time.

REFERENCES

- Agresti, A. (2002). *Categorical Data Analysis*. Hoboken, NJ: John Wiley & Sons, Inc.
- Aharonovich, E., Liu, X., Nunes, E.V., Hasin, D. (2002). Types of Major Depression and Suicide Attempts: A Study in Substance Abuse Dependent Patients. *American Journal of Psychiatry*, 159, 1600-1603.
- Aldrich, J. H., & Nelson, F. D. (1984). *Linear probability, logit, and probit models*. Newbury Park: Sage.
- American Foundation for the Prevention of Suicide. (2005). Retrieved May 15, 2008, from <http://www.afsp.org>
- Arnold, E., Goldston, D., Ruggiero, A., Reboussin, B., Daniel, S., & Hickman, E. (2003). A prospective naturalistic study of rates and predictors of rehospitalization among formerly hospitalized adolescents. *Psychiatric Services*, 54, 994-958.
- Aubry, T., Tefft, B., & Currie, R. (1995). Public attitudes and intentions regarding tenants of community mental health residences who are neighbours. *Community Mental Health Journal*, 31, 39-52.
- Baca-Garcia, E., Perez-Rodriguez, M.M., Keyes, K.M., Oquendo, M.A., Hasin, D.S., Grant, B.F., & Blanco, C. (2010). Suicidal ideation and suicide attempts in the United States: *Molecular Psychiatry*, 15, 250-259.
- Barrow, S.M., Herman, D.B., Cordova, P., & Streuning, E.L. (1999). Mortality among homeless shelter residents in New York City. *American Journal of Public Health*, 89, 529-534.
- Barak, Y., Cohen, A., & Aizenberg, D. (2004). Suicide among the homeless: A 9-year case-series analysis. *Crisis*, 25, 51-53.
- Bateman, A. (2000). Integration in psychotherapy: An evolving reality in personality disorder. *British Journal of Psychotherapy*, 17, 147-156.
- Beck, A.T, Wenzel, A., Riskind, J.H., Brown, G., Steer, R.A. (2006). Specificity of hopelessness about resolving life problems: Another test of the cognitive model of depression. *Cognitive therapy and research*, 30, 773.
- Bonin J., Fournier, L., Blais, R., Perreault, M., White, N. (2007). Are the responses of clients with psychiatric and addiction disorders using services for the homeless valid? *Canadian Journal of Psychiatry*, 52, 798-802.

- Bronfenbrenner, U. (1979). *The ecology of human development: Experiments by nature and design*. Cambridge, MA: Harvard University Press.
- Burt, M. R. (1999). *Homelessness: Programs and the people they serve: Findings of the national survey of homeless assistance providers and clients: Technical report*. Washington, DC: The Urban Institute.
- Burt, M. R. (2001). *Helping America's homeless*. Washington, DC: Urban Institute Press.
- Burt, M. R. (1996). *Practical methods for counting the homeless: A manual for state and local jurisdictions* (2nd ed.). Washington, DC: The Urban Institute.
- Burt, M. R., Pearson, C. L., Montgomery, A. E., & McDonald, W. R. (2005). *Strategies for preventing homelessness*. Washington, DC: U.S. Department of Housing and Urban Development.
- Carling, P. J. (1993). Housing and supports for persons with mental illness: Emerging approaches to research and practice. *Hospital and Community Psychiatry*, 44, 439-449.
- Calsyn, R. J., Allen, G., Morse, G. A., Smith, R., & Templehoff, B., (1993). Can You Trust Self-Report Data Provided By Homeless Mentally Ill Individuals? *Evaluation Review*, 17, 353-366.
- Caton, C., Wilkins, C., & Anderson, J. (2007). *People who experience long-term homelessness: Characteristics and interventions*. Retrieved May 15, 2008, from Toward understanding homelessness: The 2007 national symposium on homelessness research: <http://aspe.hhs.gov/hsp/homelessness/symposium07/caton/>
- Christensen, R. C., & Garces, L. K. (2006). Where is the research on homeless persons and suicide? *Psychiatric Services*, 57, doi: 10.1176/appi.ps.57.4.447.
- Coldwell, C. M., & Bender, W. S. (2007). The effectiveness of assertive community treatment for homeless populations with severe mental illness: A meta-analysis. *American Journal of Psychiatry*, 164, 393-399.
- Coleman, D., & Casey, J. T. (2007). Therapeutic mechanisms of suicide ideation: The influence of changes in automatic thoughts and immature defenses. *Crisis*, 28, 198-203.
- Cordray, D., & Pion, G. (1991). What's behind the numbers? Definitional issues in counting the homeless. *Housing Policy Debate*, 2, 587-616.
- Crocetti, G., Spiro, H., & Siassi, I. (1974). *Contemporary attitudes towards mental illness*. Pittsburgh, PA: University of Pittsburgh Press.

- Culhane, D. P., Mettraux, S., & Hadley, T. (2002). Public service reductions associated with placement of homeless persons with severe mental illness in supportive housing. *Housing Policy Debate*, 13, 107-163.
- Culhane, D., Dejowski, E., Ibanez, J., Needham, E., & Macchia, I. (1994). Public shelter admission rates in Philadelphia and New York City: The implications of turnover for sheltered population counts. *Housing Policy Debates*, 5, 107-140.
- Culhane, D. et al. (2008). *A research agenda for ending homelessness*. Washington, DC: Homelessness Research Institute.
- Desai, R. A., Liu-Mares, W., Dausey, D. J., & Rosenheck, R. A. (2003). Suicidal ideation and suicide attempts in a sample of homeless people with mental illness. *The Journal of Nervous and Mental Disease*, 191, 365-371.
- Edwards, M., Smith, I., Kudel, J., & Haythornthwaite, R. (2006). Pain-related catastrophizing as a risk factor for suicidal ideation in chronic pain. *Pain*, 126, 272-279.
- Essock, S. M., Mueser, K. T., Drake, R. E., Covell, N. H., McHugo, G. J., Frisman, L. K. et al. (2006). Comparison of ACT and standard case management for delivering integrated treatment for co-occurring disorders. *Psychiatric Services*, 57, 185-196.
- Eynan, R., Langley, J., Tolomiczenko, G., Rhodes, A. E., Links, P., Wasylenki, D. et al. (2002). The association between homelessness and suicidal ideation and behaviors: Results of a cross-sectional survey. *Suicide and Life-Threatening Behavior*, 32, 418-427.
- Fava, M., Bless, E., Otto, M. W., Pava, J. A., & Rosenbaum, J. F. (1994). Dysfunctional attitudes in major depression: Changes with pharmacotherapy. *Journal of Nervous & Mental Disease*, 182, 45-49.
- Fitzpatrick, K. M. (2007). Just thinking about it: Social Capital and suicide ideation among homeless persons. *Journal of Health Psychology*, 12, 750-760.
- Frankfort-Nachmias, C., & Nachmias, D. (2000). *Research methods in the social sciences* (6th ed.). New York: Worth.
- Gelberg, L., & Linn, L. (1989). Psychological distress among homeless adults. *The Journal of Nervous and Mental Disease*, 177, 291-295.
- Gerber, G., & Prince, P. (1999). Measuring client satisfaction with assertive community treatment. *Psychiatric Services*, 50, 546-550.
- Goldston, D.B., Daniel, S.S., Reboussin, B.A., Reboussin, D.M., Frazier, P.H., Harris, A.E. (2000). Cognitive Risk Factors and Suicide Attempts Among Formerly

- Hospitalized Adolescents: A Prospective Naturalistic Study. *Journal of the American Academy of Child and Adolescent Psychiatry*, 40, 91-99.
- Greenwood, R. M., Schaefer-McDanile, N. J., Winkel, G., & Tsemberis, S. J. (2005). Decreasing psychiatric symptoms by increasing choice in services for adults with histories of homelessness. *American Journal of Community Psychology*, 36, 223-238.
- Hawkins, J.D., Catalano, R.F., & Miller, J.Y. (1992). Risk and protective factors for alcohol and other drug problems in adolescence and early adulthood: Implications for substance abuse prevention. *Psychological Bulletin*, 112, 64-105.
- Hudson, C. (2005). Socioeconomic status and mental illness: Tests of the social causation and selection hypotheses. *American Journal of Orthopsychiatry* 75, 3-18.
- Hwang, S. W., & Dunn, J. R. (2005). Homeless people. In S. Galea, & D. Vlahov (Eds.), *Handbook of urban health: Population, methods & practice* (pp. 19-41). New York: Springer.
- Jencks, C. (2005). *The Homeless*. Harvard University Press.
- Joiner, T. (2005). *Why People Die by Suicide*. Harvard University Press.
- Kendal, W.S. (2006). Suicide and cancer: a gender-comparative study. *Annals of Oncology*, 18, 381-387.
- Kessler, R. C., Berglund, P., Borges, G., Nock, M., & Wang, P. S. (2005). Trends in suicide ideation, plans, gestures, and attempts in the United States, 1990-1992 to 2001-2003. *Journal of the American Medical Association*, 293 (20), 2487-2495.
- Kessler, R. C., McGonagle, K. A., Zhao, S., Nelson, C. B., Hughes, M., Eshleman S., et al. (1994). Lifetime and 12-month prevalence of DSM-III-R psychiatric disorders in the United States. Results from the National Comorbidity Survey. *Archives of General Psychiatry* 51, 8-19.
- Kline, R. B. (2005). *Principles and practice of structural equation modeling* (2nd Edition ed.). New York: The Guilford Press.
- Liebow, E. (1993). *Tell Them Who I Am: The Lives of Homeless Women*. New York: Penguin Books.
- Lehman, A. F., Dixon, L., Hoch, J. S., DeForge, B., Kernan, E., & Frank, R. (1999). Cost-effectiveness of assertive community treatment for homeless persons with severe mental illness. *Br J Psychiatry*, 174, 346-352.
- Lipton, F. R., Siegel, C., Hannigan, A., Samuels, J., & Baker, S. (2000). Tenure in supportive housing for homeless persons with severe mental illness. *Psychiatric Services*, 51, 479-486.

- Ilgen, M.A., Zivin, K., McCammon, R. J., & Valenstein, M. (2008). Mental illness, previous suicidality, and access to guns in the United States. *Psychiatric Services*, 59, 198-200.
- Main, T. (1998). How to think about homelessness: Balancing structural and individual causes. *Journal of Social Distress and the Homeless*, 7, 41-54.
- Marzuk, P.M., Teirney, H., Tardiff, et al. (1998). Increased risk of suicide in persons with AIDS. *Journal of the American Medical Association*, 259, 1333-1370.
- Morrell, J.P. (2007). *Voices from the Street: Truths about Homelessness from the Sisters of the Road*. Utah: Gray Sunshine.
- Mowbray, C. T., Bybee, D., Yeich, S., Ribisl, K., & Freddolino, P. P. (1993). Tracking and follow-up methods for research on homelessness. *Evaluation Review*, 17, 331-352.
- National Alliance for the Mentally Ill (NAMI). (2008). *About Treatments & Supports: Assertive Community Treatment (ACT)*. Retrieved May 15, 2008, from http://www.nami.org/Template.cfm?Section=About_Treatments_and_Supports&template=/ContentManagement/ContentDisplay.cfm&ContentID=8075
- National Alliance to End Homelessness. (2005). *Homeless population in the United States*. Retrieved September 20, 2007, from <http://www.ncpolicywatch.com>
- National Coalition for the Homeless. (2008). *Why people are homeless*. Retrieved May 20, 2008, from <http://nationalhomeless.org/publications/facts/Why.pdf>
- National Institute of Mental Health (2009). *Suicide in the U.S.: Statistics and prevention*. Retrieved May 5, 2009, from <http://www.nimh.nih.gov/health/publications/>
- National Law Center on Homelessness & Poverty. (2007). Homelessness in America: The facts. In *2007 Annual Report*.
- Nelson, G., Aubry, T., & Lafrance, A. (2007). A review of the literature on the effectiveness of housing and support, assertive community treatment, and intensive case management interventions for persons with mental illness who have been homeless. *American Journal of Orthopsychiatry*, 77, 350-361.
- North Carolina Department of Health and Human Services. (2005). *Ending homelessness*. Retrieved September 20, 2007, from <http://www.dhhs.state.nc.us/homeless/homelessfacts>
- Pable, J. (2005). Design response to homelessness. *Implications*, 4, 1-6.
- Peduzzi, P., Concato, J., Kemper, E., Holford, T.R., & Feinstein, A.R. (1996). A simulation study of the number of events per variable in logistic regression

- analysis. *Journal of Clinical Epidemiology*, 49, 1373-1379.
- Perlis, R.H., Beasley, C.M., Wines, J.D., et al., (2007). Treatment-associated suicidal ideation and adverse effects in an open, multicenter trial of fluoxetine for major depressive episodes. *Psychotherapy and Psychosomatic*, 6, 40-46.
- Pollio, D.E., & Kasden, A. (1996). Walking around with a question mark on your head: social and personal constructs among persons on the Streets, *Journal of Applied Social Sciences*, 20, 107-119.
- Pompili, M., Lester, D., Grispi, A., et al. (2009) Completed suicide in schizophrenia: evidence from a case-control study. *Psychiatry Research*, 167, 251-257.
- Prigerson, H. G., Desai, R. A., Liu-Mares, W., & Rosenheck, R. A. (2003). Suicidal ideation and suicide attempts in homeless mentally ill persons: Age-specific risks of substance abuse. *Social Psychiatry and Psychiatric Epidemiology*, 38, 213-219.
- Pugh, R. L., Ackerman, B. J., McColgan, E. B., deMesquite, P. B., Worley, P. J., & Goodman, N. J. (1994). Attitudes of adolescents toward adolescent psychiatric treatment. *Journal of Child and Family Studies*, 3, 351-363.
- Putnam, R. (2000). *Bowling Alone: The Collapse and Revival of American Community*. New York: Simon and Schuster.
- Ridgeway, P., Simpson, A., Wittman, F., & Wheeler, G. (1994). Home making and community building. *Journal of Mental Health Administration*, 21, 407-418.
- Rosenheck, R., Kaspro, W., Frisman, L., & Liu-Mares, W. (2003). Cost-effectiveness of supported housing for homeless persons with mental illness. *Archives of General Psychiatry*, 60, 940-951.
- Rubin, A. & Babbie, E.R., (2008). *Research Methods for Social Work*. 6th Edition. Thomson Brooks Cole.
- Saitz, R., Gaeta, J., Cheng, D., Richardson, J., Larson, M., & Samet, J. (2007). Risk of mortality during four years after substance detoxification in urban adults. *Journal of Urban Health*, 84, 272-282.
- Schutt, R. K., Meschede, T., & Rierdan, J. (1994). Distress, suicidal thoughts, and social support among homeless adults. *Journal of Health and Social Behavior*, 35, 134-42.
- Shadish, W. R., Cook, T. D., & Campbell, D. T. (2002). *Experimental and quasi-experimental designs for generalized causal inference*. New York: Houghton Mifflin.

- Shern, D. L., Tsembris, S., Anthony, W., Lovell, A. M., Richmond, L., Felton, C. J. et al. (2000). Serving street-dwelling individuals with psychiatric disabilities: Outcomes of a psychiatric rehabilitation clinical trial. *American Journal of Public Health, 90*, 1873-1878.
- Stefancic, A., & Tsemberis, S. (2007). Housing First for long-term shelter dwellers with psychiatric disabilities in a suburban county: A four-year study of housing access and retention. *Journal Primary Prevention, 28*, 265-279.
- Tarrier, N., Taylor, K., & Gooding, P. (2008). Cognitive-behavioral interventions to reduce suicide behavior: A systematic review and meta-analysis. *Behavior Modification, 32*, 77-108.
- Tsemberis, S., & Eisenberg, R. F. (2000). Pathways to housing: Supported Housing for street-dwelling homeless individuals with psychiatric disabilities. *Psychiatric Services, 51*, 487-493.
- Tsemberis, S., Gulcur, L., & Nakae, M. (2004). Housing First, consumer choice, and harm reduction for homeless individuals with a dual diagnosis. *American Journal of Public Health, 94*, 651-656.
- U. S. Census Bureau. (2008, May 1). *Table 1. Estimates of the population by race alone or in combination and Hispanic origin for the United States and States: July 1, 2007*.
- U.S. Department of Housing and Urban Development. (2008). *Federal definition of homeless*. Retrieved June 2, 2008, from <http://www.hud.gov/homeless/definitions.cfm>
- Weich, S., & Lewis, G. (1998). Poverty, unemployment, and common mental disorders: Population based cohort study. *British Medical Journal, 317*, 115-119.
- Weissman, M. M. et al. (1999). Prevalence of suicide ideation and attempts in nine countries. *Psychological Medicine, 29*, 9-17.
- Wenzel, A., Brown, G. K., & Beck, A. T. (2009). *Cognitive therapy for suicidal patients: Scientific and clinical applications*. Washington, DC: APA Books.
- Whitbeck, L. B., Hoyt, D. R., & Yoder, K. A. (1999). A risk-amplification model of victimization and depressive symptoms among runaway and homeless adolescents. *American Journal of Community Psychology, 27*, 273-296.
- Wong, Y. L., & Piliavin, I. (2001). Stressors, resources, and distress among homeless persons: A longitudinal analysis. *Social Science & Medicine, 52*, 1029-1042.
- Wong, Y.-L. I., Hadley, T. R., Culhane, D. P., Poulin, S. R., Davis, M. R., Cirksey, B. A., & Brown, J. L. (2006). *Predicting staying in or leaving permanent supportive*

housing that serves homeless people with serious mental illness, final report.
Washington, DC: U.S. Department of Housing and Urban Development.

Wright, J., Rubin, B., & Devine, J. (1998). *Beside the golden door: Policy, politics, and the homeless.* New York: Aldine De Gruyter.