Title

Disparities in Mental Health Service Utilization Among African Americans with Severe Mental Illness

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Disparities in Mental Health Service Utilization Among African Americans with Severe Mental Illness

by

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DISSERTATION

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ABSTRACT

BACKGROUND:
Multiple studies have found that AAs are more likely to use crisis and acute care services and less likely to use outpatient services than Whites with severe mental illness (SMI). This difference might be related to less access to outpatient services by AAs.

PURPOSE:
The purpose of this study is to determine predictors of the number of crisis, inpatient, and residential services used in 12 months.

METHODS:
This study was a secondary analysis of the Clinical Trial for Wellness Training (NR05350-04), a randomized controlled trial. Data were extracted from interviews and mental health service utilization records. Data were analyzed using descriptive methods, logistic regression, and negative binomial and Poisson regression. The Behavioral Model for Vulnerable Populations, a model that proposes health service utilization is predicted by predisposing characteristics, enabling resources, and need, was used as the theoretical framework.

RESULTS:
On bivariate analysis, only the number of residential services used varied by race. In the regression analyses, which controlled for multiple factors, race was no longer an influence, despite AAs having higher rates of homelessness and greater likelihood of victimization. The number of crisis services used was predicted by drug use, receipt of social security benefits, and age. The number of inpatient services used was predicted by drug use and receipt of social security benefits. And the number of residential services used was predicted only by enrollment in an outpatient mental health program.

CONCLUSIONS:
Crisis and inpatient service use was roughly equal between AAs and Whites. Far fewer subjects used inpatient services than crisis indicating that access to this particular service is severely limited. Predisposing characteristics and enabling resources rather than need predicted service use. Residential service use was predicted only by enabling resources in that patients enrolled in outpatient programs were most likely to use this service. It is possible that professionals in outpatient mental health programs might refer AAs less to residential services. Another consideration regarding crisis and inpatient service utilization is that the extreme vulnerability of the subjects might have obscured racial differences in this study.

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Acknowledgements

At the beginning of this journey, I thought of a doctoral degree as a personal, solitary goal; yet as the years have passed my perception has evolved. For me, it has been the process of a team of people who have supported and guided me through the process from start to finish. How I have changed and grown as a result of this, I cannot put into words. When I was a runner, I would never think of thanking the members of my relay team for helping *me* to win a race, but I now find myself in the position to thank my dissertation "team" for their parts in nurturing, educating, and bringing this document to life.

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CHAPTER 1: INTRODUCTION TO THE PROBLEM

The majority of the literature that addresses the issue of health service utilization, particularly hospitalization, among African Americans (AAs) with severe mental illness (SMI) concludes that in the absence of targeted efforts to reduce its use, AAs with SMI are more likely than Whites with SMI to use inpatient and psychiatric emergency services (Chow *et al.*, 2003; Lehman *et al.*, 1999; Snowden *et al.*, 1995; Whaley, 2004a) and are less likely to use outpatient mental health services (Dixon *et al.*, 2001; Kuno & Rothbard, 2005; Ojeda & McGuire, 2006; Snowden & Thomas, 2000). If outpatient mental health sector services are considered primary psychiatric care, it would be expected that a person using this type of service would receive both preventive services as well as coordination of any care that is not provided in that setting. Conversely, with acute care that is delivered in hospitals and emergency rooms, the expectation is that short-term care for the treatment of urgent conditions is provided. Though accessing services at every level is important and at times necessary, reliance on acute care services for the management of chronic conditions can create gaps in care that might lead to greater morbidity and mortality in this vulnerable population.

AAs with SMI are disadvantaged compared to Whites with SMI in a number of ways. Economically, AAs with SMI are more likely to live in high poverty areas (Chow *et al.*, 2003) and to be homeless than Whites with SMI (Butterfield *et al.*, 2004). With regard to stigma, AAs are more likely than Whites with SMI to be diagnosed with schizophrenia, a diagnosis with a negative connotation, as opposed to a mood disorder, a diagnosis with less associated stigma (Strakowski *et al.*, 1996; Strakowski *et al.*, 2003; Trierweiler *et al.*, 2000). And in the realm of treatment, they are also more likely to receive conventional antipsychotics even though atypical antipsychotics are associated with improved medication adherence, better efficacy (Mojtabai *et al.*, 2003), and fewer extrapyramidal and neurological effects (Mark *et al.*, 2003). Several studies have also linked atypical agents to lower rates of substance abuse (Kuno & Rothbard, 2002; Opolka *et al.*, 2004; Scheller-Gilkey *et al.*, 2003) and lower rates of acute care service utilization (Opolka *et al.*, 2003).

Thus, AAs with SMI are subject to disparities that exceed those of Whites with SMI. The effect of experiencing multiple levels of disparity has not been extensively studied. Prior research suggests the existence of dual disparities, but little is known about their effects or strategies to reduce them. The ability to predict individuals at risk for high use of acute care services and low use of outpatient services, might be a first step in identifying and addressing these disparities.

Statement of the Problem

Some researchers report that AAs are more likely to use general medical or primary care services for mental health care than Whites (Cooper-Patrick *et al.*, 1999b; Snowden & Pingitore, 2002; Snowden & Thomas, 2000). However, the samples in these studies lack generalizability because they were conducted in community and outpatient settings, sites where AAs with SMI are less likely to be served. Furthermore, Cooper-Patrick and colleagues' (1999b) study did not include persons with SMI and was conducted in a managed care setting.

One setting identified as serving large numbers of AAs with SMI is jail. Though this is not what is traditionally thought of as the ideal source of treatment, this may be a major provider of mental health services to AAs with SMI. Of the SMI involved in the criminal justice system, individuals are two times more likely to be AA, two times more likely to be male, and six times more likely to have a history of substance abuse and a high rate of previous inpatient episodes (Fisher *et al.*, 2000). Furthermore, in another study, AA males with SMI were more likely than White males, White females, and AA females to be readmitted to psychiatric inpatient settings after release from legal charges (Linhorst *et al.*, 1998). In one study of 152 homeless, AAs and Whites diagnosed with schizophrenia spectrum and mood disorders, assertive community treatment was effective in reducing time spent in jail (Lehman et al., 1999). However, the problem with the use of this treatment is that AAs are less likely to be referred to and use this and other types of outpatient mental health programs (Barrio, 2003b; Kuno & Rothbard, 2005; Sullivan & Spritzer, 1997; Thompson *et al.*, 2003).

Outpatient service referrals are facilitated by longer hospital stays and substance abuse (Thompson et al., 2003), contact with a regular primary care provider, social service contact, or criminal justice referral (Chow et al., 2003; McAlpine & Mechanic, 2000), as well as insurance coverage or psychiatric institutionalization (Barrio *et al.*, 2003b; Fisher et al., 2000). Since most of the above factors (criminal justice involvement and more frequent hospitalization) indicate more severe disease or dysfunction, it is possible that less severely impaired AAs with SMI are not sufficiently represented in outpatient mental health research.

Another service setting where AAs with SMI are more likely to be seen than other racial groups is in a self-help agency. Self-help agencies that provide practical resources, including assistance with food, housing, entitlements, and other support services, are utilized more by AAs, particularly if they are homeless (Segal et al., 1995; Theriot *et al.*, 2003). This might indicate that AAs are motivated to utilize services that have relevance for them, meet perceived needs, and are accessible. In a study of 70 SMI adults among which approximately half were AA, participants reported difficulty in accessing the services they needed in the community (Evans *et al.*, 2004).

Insurance coverage is an important resource for accessing services. AAs are more likely to be uninsured or to have public benefits such as Medicaid (Rollman et al., 2002) and are more likely to live in poverty than Whites (Snowden & Thomas, 2000).

In summary, service utilization by SMI persons varies by setting. Service utilization for AAs with SMI is most likely to occur in acute care or other institutional settings, such as jail, and less likely to occur in outpatient settings. Self-help agencies are the exception among community settings, but these agencies may or may not offer mental health services. Insurance status also affects health care service utilization. The literature indicates that problems that contribute to this disparity include lack of outreach to this population and lack of referral, except for in the most severe cases of mental illness.

Clearly this is a problem that is complex and that is influenced by a variety of factors. The Behavioral Model for Vulnerable Populations (BMVP) by Gelberg, Andersen, and Leake (2000) has been used to identify these factors or predictors of health service utilization in populations that experience multiple barriers to accessing health services.

Purpose and Aims

The overall goal of this study is to determine at twelve months, the extent to which AA race as compared to White race predicts differences in mental health service utilization among a community sample of individuals with SMI above and beyond other variables. The specific aims of this study were to use the BMVP to:

1. examine differences between AAs and Whites with SMI with regard to mental health service utilization including:
    a. number of crisis services used
    b. number of inpatient services used and
    c. number of residential services used

   controlling for predisposing, enabling, and need variables and vulnerable characteristics.
2. examine differences between AAs and Whites with SMI with regard to mental health service utilization on:
    a. time to first crisis readmission
    b. time to first inpatient readmission and
    c. time to first residential readmission

   controlling for predisposing, enabling, and need variables and vulnerable characteristics.
3. examine differences between AAs and Whites with SMI with regard to mental health service utilization on:
    a. length of stay in inpatient services and
    b. length of stay in residential services

   controlling for predisposing, enabling, and need variables and vulnerable characteristics.

Significance and Contribution to Nursing Science

Both mental illness and ethnic minority status have the potential to adversely affect the health and well being of this vulnerable population. Though the existence of health disparities experienced by African Americans with SMI has been suggested, there is limited research that addresses disparities while controlling for personal, economic, and illness factors. Few studies have looked at the impact of disparities that persist above and beyond those associated with SMI. This secondary analysis provides the opportunity to examine extensive data for outcomes and covariates over a 12-month period with subjects who were recruited at a similar level of care. This study has the potential to advance knowledge in this research area, provide information for mental health service planning, and insights for health care providers.

CHAPTER 2: CONCEPTUAL FRAMEWORK AND REVIEW OF LITERATURE

A Description of Health Disparity

The Institute of Medicine's (IOM) report, entitled *Unequal Treatment: Confronting Racial and Ethnic Disparities in Healthcare*, defines healthcare disparities as "racial or ethnic differences in the quality of healthcare that are not due to access-related factors or clinical needs, preferences, and appropriateness of intervention" (Academies, 2003, pp. 3-4). In an extensive review of the literature by the Institute of Medicine study committee, it is reported that racial and ethnic healthcare disparities exist independent of socioeconomic conditions such as income and insurance status. They span the breadth of healthcare specialties including cardiovascular and cerebrovascular care, cancer treatment, HIV and AIDS care, diabetes, and mental health care to name a few. These disparities are linked to poorer health outcomes when compared to Whites in the United States population (Academies, 2003).

Discrimination is defined as differences in care that result from biases, prejudices, stereotyping, and uncertainty in clinical communication and decision-making (Academies, 2003). According to the report, there are three mechanisms that work to produce racial and ethnic health disparities. The first mechanism is bias or negative attitudes toward ethnic minorities. These attitudes might be conscious or unconscious, but they can influence the clinical experience of ethnic minorities in a negative way. The second mechanism is clinical uncertainty or cultural unfamiliarity in interactions with ethnic minority clients. It is believed that providers, given little time and information, might draw conclusions based on preconceived information and base clinical decisions on potentially erroneous data. The third mechanism is stereotypical beliefs about the behavior or health of ethnic minorities. For AAs in general, this includes beliefs about treatment and medication adherence, and for AAs with SMI this can also include misconceptions about violent behavior.

Both the SMI and AAs are underserved populations that experience health disparities. The most concrete evidence of health inequalities is disparate mortality rates. In a study of nearly 2,000 subjects diagnosed with schizophrenia compared to nearly 10,000 non-mentally ill subscribers to a health plan, mortality rates in the mentally ill population were approximately eight times that of the non-mentally ill group (Enger *et al.*, 2004). Colton and Manderscheid (2006), in a study of mortality in eight states, reported that on average, subjects with SMI died from one to ten years earlier than those without SMI. Causes of death included heart disease, cancer, cerebrovascular disease, and respiratory conditions, similar to causes found in the general population. For the non-mentally ill general population of AAs, premature death rates have not only persisted over the last 50 years, but according to Levine and colleagues (2001), have increased by 20%. According to Williams (1999), multiple factors, including personal and societal factors, influence health disparities.

Individuals with SMI also experience multiple factors that might influence health disparities and poor health outcomes. In a discussion of multiple identity status, Sanders Thompson and colleagues (2004) reported that common sources of discrimination include mental disability, race, physical disability, economic status, homelessness, and prison history. In a study of 1,824 persons with SMI in a consumer operated service program, greater than 50% reported experiencing discrimination as a result of mental illness, and of those who were AA, 65% of them reported experiencing discrimination as a result of both race and mental illness (Corrigan et al., 2003). Though “multiple identity status” discrimination was associated with increased psychiatric symptomatology (Thompson et al. 2004), it is unknown in what other ways experiencing multiple sources of discrimination might contribute to health disparities.

The purpose of this chapter is to discuss the application of the BMVP and to critically review the SMI literature pertaining to disparities among AAs with SMI in the context of the model. Because the effects of ethnic minority group membership might differ among groups and because much of the literature compares AAs to Whites, these groups are the focus of this chapter and much of the research detailed. The chapter begins with a description of the model, followed by its development and limitations. The chapter proceeds with a critique of the literature regarding disparities in socioeconomic conditions, treatment, and health service utilization among AAs with SMI. Finally, the chapter concludes by identifying gaps in knowledge. (The studies reviewed can be found in Table 2.1 in the Appendix.)

The major data retrieval strategy used for the literature review is the online computer search of Pub Med. The search was limited to data-based studies published in English between 1995 and 2007 and that included adult subjects, 18 years and older. The keywords *severe mental illness*, *schizophrenia*, *bipolar disorder*, and *major depression*, were combined with the keywords *race*, *ethnicity*, *African American*, and *health service utilization*. Classic and frequently cited references were also obtained. Studies that pertained primarily to dementia, geriatric or nursing home populations; genetics; primary diagnoses other than schizophrenia, bipolar disorder, or major depression; and without a focus on racial differences between whites and AAs were excluded.

Theoretical Models for the Study of Health Service Utilization

A Description of Health Service Utilization

Theoretical Definition

Health service utilization (HSU) is a frequently used term that appears to be a concrete concept, yet it has various interpretations and synonyms. Pertaining to medical care, the term HSU is used interchangeably with clinical preventive medical services (Daumit, et al., 2002), inpatient and emergency room utilization (Davidson, Giancola, Gast, Ho, & Waddell, 2003), general medical services (Cradock-O'Leary, et al., 2002), trauma services (Posel & Moss, 1998), and routine and preventive health behaviors to name a few (Dickerson, Pater, & Origoni, 2002). Mental health care variants of the term HSU include psychiatric emergency services, inpatient psychiatric care (Catalano, et al., 2003), psychiatric or outpatient visits (Daumit et al., 2002), and psychiatric admission or length of stay (Posel & Moss, 1998). The continued study of acute and ambulatory care service utilization is important in order to determine the accessibility to underserved groups as well as the effect on morbidity and mortality outcomes as a result of HSU.

The words that comprise the term HSU are defined, followed by the writer's definition of HSU based on these definitions.

> *Health*: state of complete physical, mental, or social well-being and not merely the absence of disease or infirmity (Preamble to the Constitution of the World Health Organization, 1948).
>
> *Service*: performance of official or professional duties; help, benefit (*Merriam-Webster's Collegiate Dictionary, 2005*).

> *Utilization*: act of employing something; habitual or customary usage; privilege or benefit of using something (*Merriam-Webster's Collegiate Dictionary, 2005*).

The combination of the individual terms, *health*, *service*, and *utilization* yields a definition of HSU as the practice of employing the labor of health care providers for the purpose of achieving physical, mental, or social well-being for clients. This definition of utilization alludes to the concepts of ability, habit, privilege, knowledge, and a health care provider's relationship to an individual's propensity to use services. It also alludes to the outcomes of these conditions for the individual.

Operational Definition

Similar to the variations in the theoretical definition of HSU, operational definitions or methods of measurement of HSU also vary. The measurement of HSU is distinguished by a number of identifiers related to quantity of services, for example, number of inpatient hospitalizations, number of days hospitalized or length of stay, number of emergency department admissions, number of health screenings received, number of Medicaid claims, and time spent with the provider (Berren, et al., 1999; Cradock-O'Leary, et al., 2002; Daumit, et al., 2002; Davidson, et al., 2003; Dickerson et al., 2002; Posel & Moss, 1998). Amount of billing expenditures in public and private pay insurance systems, type of provider, treatment site, and medications used are other indicators utilized to measure HSU operationally (Catalano, et al., 2003; Gamache, Rosenheck, & Tessler, 2000). These operational indicators of HSU are appropriate to examine HSU in medical as well as mental health service utilization. One important HSU indicator specific to mental health is type of provider, which could indicate contact with a variety of mental health providers from professionals, such as psychiatrists, to lay vocational counselors. In order to determine the extent of equity between AAs and Whites with SMI, it would be important to examine their access to professional providers, receipt of treatment, and differential use of acute and ambulatory care services.

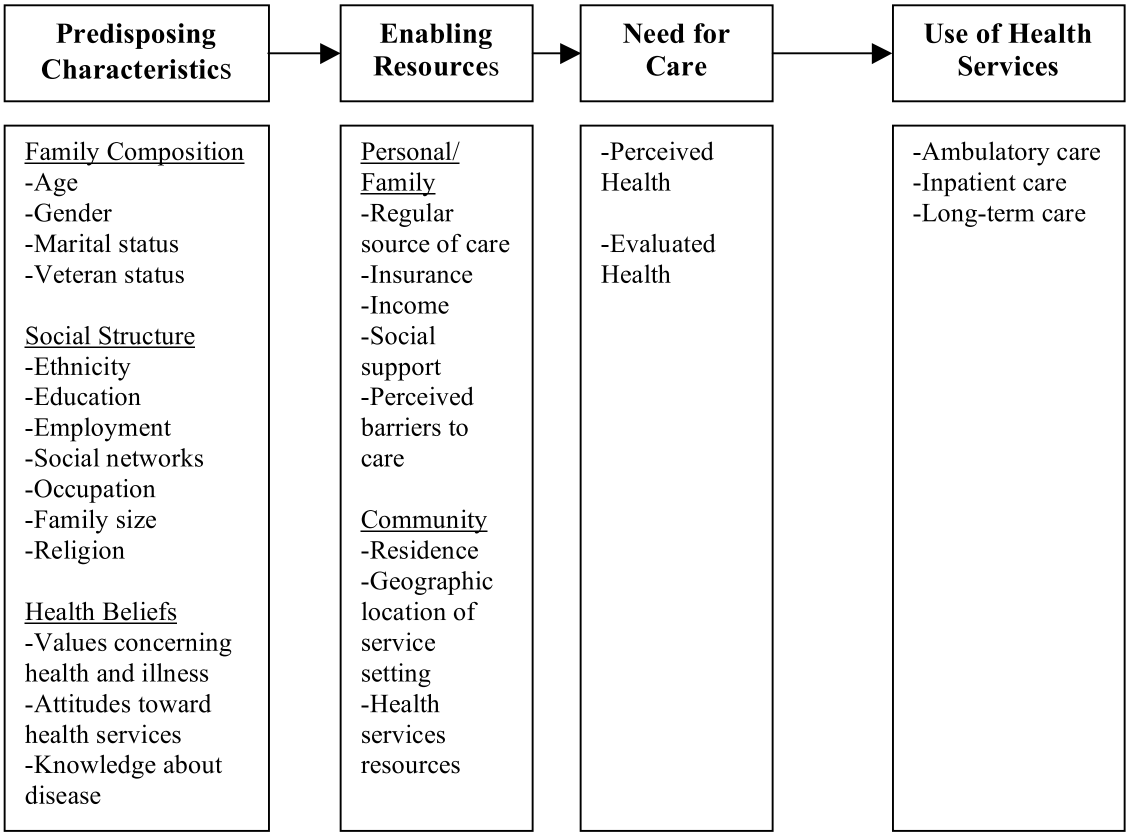
Health Service Utilization Frameworks

Many factors influence HSU. The use of theoretical models has the potential to bring understanding to the multidimensional aspects of HSU research among AAs with SMI. Two such models are the Andersen Behavioral Model and the Behavioral Model for Vulnerable Populations. Each of the models is presented, followed by an evaluation of its purpose, methods of use in other studies, and its limitations in application.

Andersen's Behavioral Model

The Andersen Behavioral Model (ABM) emerged in the late 1960s and was developed out of a need to integrate theories of economic, social, and psychological models that addressed either the individual's ability to pay for services *or* specific stimuli that prompts treatment seeking behavior, respectively (Andersen, 1968). The goal of Andersen's approach was to explain the family unit's health service utilization as a function of three indicators: (a) predisposing characteristics, (b) enabling resources, and (c) need for care (See Figure 2.1. The figure does not include all of the possible concepts that could be assessed in each of the domains.)

Figure 2.1. Andersen's Behavioral Model (Andersen, 1968)



Predisposing Characteristics

Predisposing characteristics of HSU are defined by Andersen (1968) as qualities of an individual or family that are in existence before the onset of an illness. Individual characteristics in this domain are divided into three categories, family composition, social structure, and health beliefs. Components of family composition include basic demographic data such as age, gender, and marital status along with other fixed concepts that cannot be manipulated in a research study. Social structure encompasses social class as defined by occupation, education, and race. Health beliefs involve subjective measures of the individual's or family's values, attitudes, and knowledge as applied to the receipt of health services, perception of well-being, and attitudes and knowledge of health care providers and the health care system.

Researchers utilizing the ABM interpret predisposing characteristics of HSU using various indicators. The indicators are adapted to fit the needs of the researchers and to reflect the changes in health care in the United States and client population over time. For example, in two studies, HIV status was the predisposing variable to HSU (Kilbourne et al., 2002; S. R. Smith, Boyd, & Kirking, 1999). In other studies, predisposing factors to HSU were locus of control (Bazargan, Bazargan, & Baker, 1998), housing or living arrangements (Afilalo et al., 2004; Bazargan et al., 1998), smoking or drinking behavior (Broyles, McAuley, & Baird-Holmes, 1999), and immigrant status (Afilalo et al., 2004).

Enabling Resources

Enabling resources are conditions that permit the use of health services in response to the values or needs of an individual, family, or community (Andersen, 1968). These resources may be financial means to obtain services, such as health insurance and income. Geographic location of service settings is also important with regard to general accessibility and ease of obtaining care. Other family and community resources include having a regular source of care, i.e. a primary care provider. Studies using enabling resources indicators of the ABM include private versus public insurance (Bazargan et al., 1998); uninsured versus having public benefits (Broyles et al., 1999); perception of support and residential stability (Bazargan et al., 1998); self efficacy and communication (Frank et al., 1997); and hour of visit to the emergency department (as an indicator of availability to access services) (Afilalo et al., 2004).

Need for Care

Andersen describes need for care as the most immediate cause of HSU (Andersen, 1968). This domain includes perceived and evaluated health. Perceived health is the individual's or family's self report of health and illness, symptoms, and response to treatment. Evaluated health is the objective measure substantiated by provider evaluation. Indicators of need include number of disability days or seeing a physician for treatment (Andersen, 1968); t-cell count in HIV populations (Andersen et al., 2000; Kilbourne et al., 2002; S.R. Smith et al., 1999); presence of chronic health conditions or prominent risk factors (Afilalo et al., 2004; Bazargan et al., 1998; Broyles et al., 1999; Kilbourne et al., 2002); and symptom severity or impairment (Afilalo et al., 2004; Henton, Hays, Walker, & Atwood, 2002).

Use of Health Services

Originally, Andersen (1968) refers to use of health services as care that is necessitated by the severity of the condition or a decision made by a provider. Use of health services could be discretionary or nondiscretionary. Discretionary use is that which is chosen, for example a choice could be made to schedule an annual preventive examination. The opposite end of the spectrum is nondiscretionary use that is involuntary or necessitated by the severity of the condition such as the need for involuntary psychiatric commitment. The terms discretionary and nondiscretionary compare to outpatient or primary care versus acute care or emergency service utilization. Use of health services measures include hospitalization days, number of visits to physicians and dentists, expenditures related to HSU and prescription drug costs (Andersen, 1968); number of hospitalizations, and ambulatory care and emergency department visits (Bazargan et al., 1998; Broyles et al., 1999; G.C. Smith, 2003; S.R. Smith et al., 1999). Other measures of use of health services include dichotomous measures, such as client follow-up on health recommendations or receipt of care within the past six months (Frank et al., 1997).

More recent studies using the ABM are less likely to estimate cost as a measure of use of health services. Henton and colleagues (2002) was the only study found that used cost as a measure of use of health services in the past 10 years. Andersen (1968) cautions about the use of cost as a measure because it is not able to account for the use of services that are free or paid for on a sliding scale.

Limitations of Andersen's Behavioral Model

Andersen proposed using the values, beliefs, and income of the family patriarch as a reflection of the health behaviors of all family members. This approach presumes that the values, beliefs, and income of one family member, namely the male's, are consistent with those of all other members. Currently, researchers focus on the individual, recognizing that each member of a family has unique health beliefs and habits. This approach has been used without any loss of meaning of the model's concepts.

Another assumption of the model is that health care providers are fair and impartial and that personal factors, economic resources, geography, and degree of illness alone determine HSU. The model does not account for the effects of provider- and systems-level disparities other than how those hardships might affect self-concept in predisposing characteristics. Barriers to HSU, such as biased providers, that are external to the individual, do not have a natural place within the model. The investigator must choose a domain that is best suited in the absence of an operational definition of the new concept. It is unknown how this might affect the validity of the results.

The predisposing characteristics domain has a mixture of empiric and highly abstract concepts that can be difficult to measure and seem to have infinite possibilities. These include intangible qualities such as self-esteem, values, and beliefs. Naturally, the value of the use of measures of intangible qualities is dependent on the validity and reliability of the tool used to measure it. This weakness is associated with a particular research design and is not reflective of a flaw in the model.

In applying this model to a mentally ill population, psychiatric diagnosis has the potential to influence health beliefs in the predisposing characteristics domain, but it can also be a component of evaluated or perceived need. If investigators create operational definitions of the concepts and apply them to domains according to Andersen's criteria, these ambiguities can be reduced.

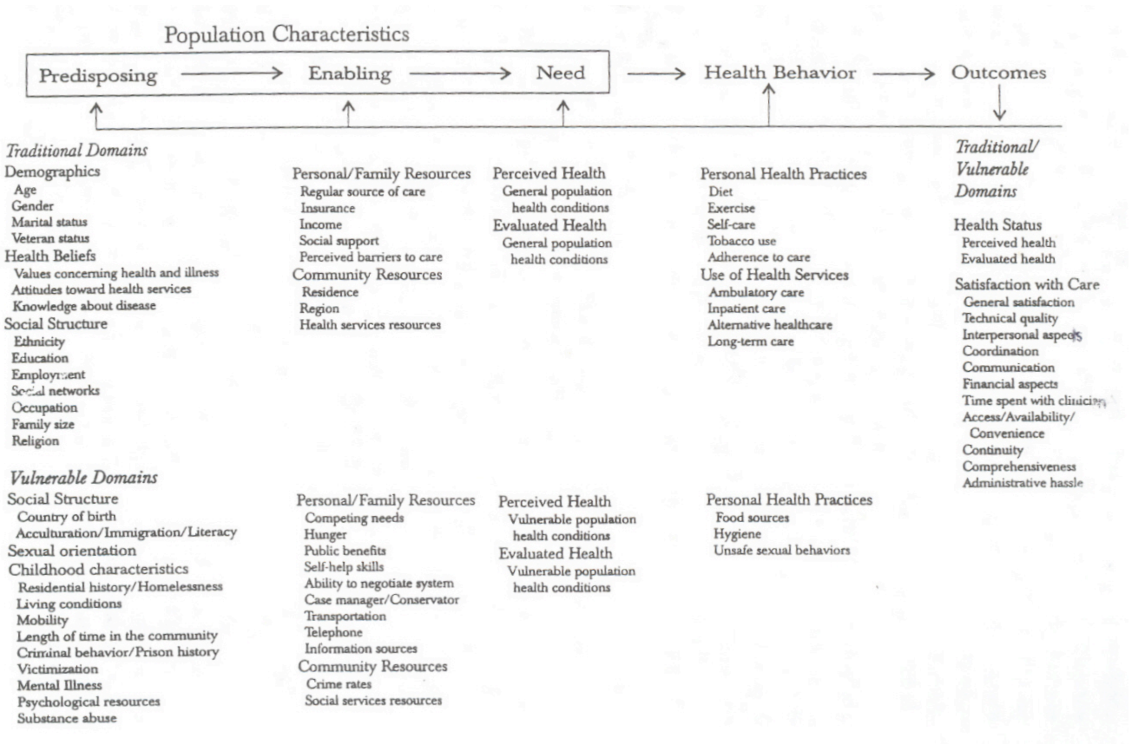
There was one study located in which the ABM was used for a population of individuals with SMI (Lemming, et al., 2004). (See Table 2.2 for studies using ABM.) However, the ability to identify factors that predict an individual's use of primary care or emergency services is desirable so that nurses and other health care professionals will have the knowledge necessary to implement interventions to improve health outcomes and reduce expenditures from excess use of acute services. The lack of acknowledgement of the potential for discrimination is a concern with the use of this model. It is likely that recognition of these limitations prompted it's revision, the Behavioral Model for Vulnerable Populations, that is better suited to address the HSU of individuals with multiple needs.

Behavioral Model for Vulnerable Populations

Vulnerable populations are those at risk for poor physical, psychological, and social health with a high probability of becoming ill over time (Aday, 1994). Vulnerable populations include high-risk mothers and infants, persons with HIV/AIDS, substance abuse problems, chronic illness or disabilities, and homelessness. Individuals belonging to racial and ethnic minority groups, and those with mental illnesses are also amongst those considered vulnerable (Aday, 1994). African Americans with SMI experience multiple identity status and are vulnerable not only because of mental illness, but are also vulnerable because of race/ethnicity, substance abuse, homelessness, and chronic diseases (Corrigan et al., 2003; Levine et al., 2001; Thompson et al., 2004; Williams, 1999). As the number of risk factors increases, the likelihood of developing disease increases as well.

The purpose of the Behavioral Model for Vulnerable Populations (BMVP) is to account for the influence of vulnerability on HSU and health status (Gelberg, Andersen, & Leake, 2000). The model is consistent with its predecessor, the ABM, in that it is linear and the domains of predisposing characteristics, enabling resources, and need for care remain, but are grouped as population characteristics (see Figure 2.2). There are, however, several changes to the model: (a) concepts in the model are divided into traditional and vulnerable domains, (b) the health behavior domain is added, and (c) an outcomes domain is added, where use of health services is no longer the outcome or predictor, but falls under the health behavior domain as a contributing factor. The traditional domains consist of indicators typical to the general population, and the vulnerable domains consist of indicators that pertain to those who are viewed as being "at-risk."

Figure 2.2. Behavioral Model for Vulnerable Populations (Gelberg et al., 2000)



Vulnerable characteristics

Predisposing characteristics, enabling resources, and need for care factors, concepts that were previously discussed with regard to the ABM, retain their meaning in this model, with the exception of those concepts in the vulnerable domains. For example, in one study on homelessness that used the BMVP, predisposing characteristics in the vulnerable domains included conditions that tend to coexist with the experience of being unstably housed, such as a history of abuse, imprisonment, substance abuse, and mental illness (Desai, Rosenheck, & Kasprow, 2003; Gelberg et al., 2000; Lim, Andersen, Leake, Cunningham, & Gelberg, 2002; Swanson, Andersen, & Gelberg, 2003).

Predisposing characteristics affect the likelihood of developing illness, illness severity, as well as health care availability.

Vulnerable characteristics associated with enabling resources involve primarily the concept of competing needs. In studies by Lim and colleagues (2002) and Swanson and colleagues (2003), both studies of homeless women, this was assessed by way of self-reports of difficulty in meeting basic survival needs such as food, shelter, and locating restroom and shower facilities.

In terms of need for care characteristics, vulnerability has been expressed as symptom severity, disability, and functional limitations (Gelberg et al., 2000; Katerndahl & Parchman, 2002; Lim et al., 2002; Swanson et al., 2003). These factors are consistent with Andersen’s (1968) original description of need as the most immediate prompt for an individual to utilize health services. There was one study located that applied this model to a mentally ill population (Desai et al., 2003). The investigators included vulnerable characteristics pertaining to homelessness and mental illness in the predisposing characteristics domain.

Health Behavior

Personal health practices and use of health services comprise the health behavior domain. Personal health practices, such as self-care, diet, exercise, and adherence, comprise the traditional domain; and the vulnerable domain for personal health practices includes food sources, hygiene, and unsafe sexual practices. Use of health service indicators is similar to those previously discussed in the ABM.

Outcomes

The final addition to the BMVP is the outcomes domain. The rationale for this addition is to determine the effect of HSU on health outcomes, such as perceived and evaluated health, and client satisfaction (Gelberg et al., 2000).

Limitations of the Behavioral Model for Vulnerable Populations

Similar to ABM, this model does not directly address disparities, but their impact is addressed, particularly in the vulnerable characteristics of the predisposing characteristics and enabling resources domains. However, the expansion of the domains introduces more variables to the model, which could impact statistical power, the more variables that are used to explain HSU.

The outcomes domain is also potentially problematic. First, there is overlap in the variables in the need and outcome domains. Perceived and evaluated health status appears in both domains without any clarification of how the two vary from one another in meaning or measurement. Many researchers who have used this model have omitted the outcome domain.

Despite these limitations, the BMVP makes a valuable contribution to the original model in terms of distinguishing traditional and vulnerable characteristics that more adequately account for the special needs and qualities of vulnerable populations. It is an excellent model to guide research studies that examine factors that contribute to the vulnerability of AAs with SMI that affect their ability to access and utilize health services. Though the BMVP has more commonly been used in studies of homeless individuals, it has been used effectively in mentally ill homeless populations (Desai et al., 2003; Gamache et al., 2000) and shows promise for use with AAs with SMI who possess similar vulnerable qualities.

Review of the Literature

In a study of 6,067 Medicaid insured outpatients diagnosed with schizophrenia that received no treatment, 48% were young AA males (dosReis et al., 2002). No studies were found that address the obstacles specific to AAs or males in particular with regard to obtaining mental health care. But, in a study of treatment for major depression in AA women (N=267), treatment adherence and completion were facilitated by intensive outreach by providers to recruit and retain subjects (Miranda et al., 2003), i.e. education, assistance with childcare and transportation, and establishing trust with subjects for the purpose of engagement with the study. There are numerous studies that have examined disparities in mental health and care of AAs with SMI. The following sections are divided into predisposing, enabling, and need characteristics and the disparities between AAs and Whites within each category.

Predisposing Characteristics

Homelessness

Several researchers report that homelessness among AA with SMI occurs at disproportionate rates than it does for Whites with the same conditions (Butterfield et al., 2004; Mark et al., 2003; Zigler & Glick, 1988). The reason this occurs is unknown. In a study of 113 AAs admitted to a state psychiatric hospital, Whaley (2002b) reported that nine out of every 10 AAs with SMI were homeless. Lehman and colleagues (1999), in a study of 152 homeless persons with SMI assigned to assertive community treatment, reported that despite this program’s demonstrated effectiveness for reducing homelessness, AAs were still less likely than Whites to achieve stable housing.

In a study of 208 adults with SMI, White, Chafetz and colleagues (2006) found that subjects who were homeless were two times as likely to have been a victim of violence compared with those who were not homeless. In another study of 10,340 adults with SMI, homelessness was associated with being AA, male, and with younger age (Folsom, et al., 2005). Homelessness was also associated with higher rates of substance use and lower overall functioning. As a result, these subjects were also more likely to use crisis and inpatient services and less likely to use outpatient mental health services (Folsom, et al., 2005).

Substance Use

Reports from the literature regarding substance abuse in AAs and Whites with SMI largely show higher rates of substance abuse in AAs with SMI. According to Whaley (2004b), AA men with SMI who perceived their social environment as more threatening were more likely to abuse substances. Montross and colleagues (2005) found that rates of comorbid substance abuse in a sample of 6,424 adults with schizophrenia were higher in AAs (25%) than among Whites (22%). In this study, comorbid substance use was predicted by AA race, male gender, and homelessness. This indicates that one vulnerability can predispose a person to another vulnerability. Furthermore, Bolden and Wicks (2005), in a nationwide study of more than 4,000,000 subjects, reported that the second leading diagnosis for AAs (after psychosis) was drug or alcohol dependence.

When differentiating types of substances used, there was some variation. In a study of 376 AA and White inpatients diagnosed with schizophrenia spectrum disorders, bipolar affective disorder, and post-traumatic stress disorder, AAs were found to have higher rates of the use of cocaine and crack than Whites, but similar rates for intravenous drug and alcohol use (Butterfield, et al., 2004; Chen, et al., 1998; Chung, et al., 1995; Compton, et al., 2000; Copeland, et al., 2003; Grella, et al., 2006; Lambert, et al., 1996).

In one study, there appeared to be a different finding. Among greater than 18,000 community dwelling individuals diagnosed with disorders ranging from schizophrenia to dysthymia, there were lower rates of alcohol and substance use in AAs when compared to Whites (5.2% versus 6.0% drug and 12.3% versus 12.7% alcohol, respectively) (Zhang & Snowden, 1999). There are several problems with this study, however, due to the inclusion of less severe disorders such as dysthymia, anorexia nervosa, and personality disorders; the low percentage of AAs in the sample (19%); and the inclusion of adults over the age of 64. Unlike the other studies in which the samples were composed of subjects with SMI, the sample used in this study was not and as a result, the findings are therefore not applicable to the SMI population.

Sequelae of substance use are also important to consider, since among AAs with SMI, use is most common. Substance abuse was found to be associated with time spent in jail (White, et al., 2006) and greater severity of psychiatric symptoms and emergency use (related to overdose) (Lundgren, et al., 2005), as well as a lower likelihood of having medical insurance (Folsom, et al., 2005) and psychiatric inpatient hospitalization (Prince, 2007).

Enabling Resources

Socioeconomic Status

Studies that addressed socioeconomic status in relation to health disparities for AAs with SMI were limited. In general, SMI has been found to be associated with AA identity, a low SES, poor physical health, substance abuse, and poor access to health insurance (McAlpine & Mechanic, 2000). Chung and colleagues (1995), in a study of 164 AAs and Whites diagnosed with major mood or psychotic disorders, found that Whites were more likely to have a higher socioeconomic status than AAs at a rate of 77% to 50%. Snowden & Thomas (2000) in their study of 13,791 subjects (diagnoses not specified) found that although AAs who are privately and publicly insured both use outpatient mental health services less than similarly insured whites, it was more pronounced in the higher socioeconomic status group (public 4.5% AA versus 7.3% White; private 1.4% AA versus 4.7% White). Level of education was also associated with mental health service utilization. As level of education increased, use of mental health services increased as well (Hines-Martin, et al., 2004; Ojeda, & McGuire, 2006; Prince, 2007).

Although SMI appears to promote a downward trend in society for Whites as well as AAs, AAs are more negatively affected by poor economic conditions on housing, insurance, geographic disparities, and social support. According to Chow and colleagues (2003), in a study of greater than 78,000 individuals with SMI, AAs were overrepresented in high poverty areas and were more likely to receive a diagnosis of schizophrenia as compared to those living in low poverty areas. Furthermore, Kuno and Rothbard (2005) reported that AAs that live in low income, high poverty areas also had less access to intensive case management services and spent more days in the hospital than Whites or individuals that lived in low poverty areas (Kuno & Rothbard, 2005).

Chow and colleagues (2003) also found that both a SMI diagnosis and lower SES resulted in more restrictive treatment for AAs when compared with Whites. Specifically, treatment for AAs was more likely to involve higher neuroleptic dosages, greater usage of “as needed” medications, and an increase in the use of seclusion and restraints (Chow et al., 2003). There were no other recent studies located that pertained to racial disparities with regard to the use of seclusion and restraint.

Insurance

Insurance status also affects health service utilization. In the general population, AAs are more likely to be uninsured than Whites or to have public benefits such as Medicaid (Rollman et al., 2002). Even for those with Medicaid, access to health care can still be problematic. In fact, privately insured patients were more likely to utilize outpatient mental health services than those with Medicaid. This could possibly be related to the cost of services, such as co-payments for visits and prescription medications, which might deter lower income individuals from seeking outpatient care (Snowden & Thomas, 2000). This could result in either no use of necessary mental health services or reliance on acute care to obtain services.

Among the uninsured, Snowden and Thomas (2000), reported that AAs were more likely to live in poverty than Whites. As a result, Whites might be more able to pay for needed services than AAs. Nonetheless, even in higher income brackets, AAs were still less likely than Whites to receive specialty mental health services, implying that disparities in mental health service utilization are not limited to those with a lack of economic resources.

Social Support

Marital status is an indicator of social support and might affect the use of mental health services. In Hines-Martin and colleagues (2004) study of 739 adults, being married was associated with better familiarity with and use of mental health services. In a study of 376 SMI inpatients in a Veteran's Administration study, AAs with SMI were less likely to be married than Whites (38% of Whites vs. 18% of AAs currently married) (Butterfield et al., 2004). In another study of a sample composed entirely of AAs with SMI with high rates of homelessness, 73% (n=86) of subjects were never married (Whaley, 2002b).

With regard to perceived coping resources, however, researchers reported that AAs with SMI had the perception of having the same or greater coping resources and support as Whites (Brown et al., 1996; Pollack *et al.*, 2000). Because AAs with SMI are disadvantaged in so many ways, this finding appears somewhat paradoxical. It is unknown if this variation in actual and perceived coping resources is due to measurement of coping, levels of distress, or both.

Provider Influence or Bias

Providers are often advocates for their patients and assist them with meeting their health care needs within the system. A patient with an effective partnership with a provider can navigate the system more efficiently. Conversely, a relationship with a provider that is hindered by bias, might present a barrier to the use of services and meeting health care needs.

Provider influence or bias is a consideration in both psychiatric diagnosis and treatment. With regard to diagnosis, Adebimpe (1981) was one of first researchers that alluded to provider error as "misdiagnosis." In this classic review, Adebimpe attributes the following factors, either independently or concurrently, to the misdiagnosis of AAs with schizophrenia: cultural distance between patient and provider, stereotypes of AA psychopathology, false positive symptoms, and/or biased diagnostic instruments.

Cultural distance is described as differences in communication patterns, vocabulary, values, and expressions of distress that contribute to error in interpretation of symptoms. Stereotypes of AA psychopathology include: beliefs about hostility, reluctance to accept treatment, not being “psychologically-minded”, and the provider’s underrecognition of depressive symptoms. False positive symptoms include those that are attributed to AAs due to insufficient information, flat affect, and paranoia leading to diagnoses of schizophrenia. And finally, diagnostic instruments that are used to assess symptoms may be culturally biased (Adebimpe, 1981). In a study of 50 AA male college students who were given the Minnesota Multiphasic Personality Inventory (MMPI) and the Racial Identity Attitude Scale-Black, Short-Form (RIAS-B), scores on the RIAS-B that indicated normative racial identity were associated with MMPI scales for antisocial personality attributes (p=.012) (Whatley et al., 2003).

Although not supported in all studies, ethnic incongruence, or a difference in ethnicity between patient and provider, might also lead to disparities in the diagnosis of SMI. The stress produced by dealing with cultural differences can influence the effectiveness and quality of relationships with the provider. Salyers and Bond (2001), in a study of 97 case managers in assertive community treatment programs, found that White case managers report higher rates of emotional exhaustion and depersonalization, (identified as components of burnout) if their caseloads were overrepresented by non-White individuals (races not specified). And according to Mirabi and colleagues (1998), burnout produces negative attitudes.

Whaley (2001) reported that ethnic congruence might make patients more comfortable seeking care as well. In a study of outpatients (N not specified) with schizophrenia and adjustment reaction disorder, researchers found that matching patients and providers by ethnicity and language spoken reduced emergency service utilization (Snowden et al., 1995). In another study where patients and providers were ethnically matched, 1,662 AAs and Whites identified as having "some psychiatric distress" were found to have more productive and collaborative relationships with providers if they were from similar ethnic backgrounds (Cooper-Patrick et al., 1999a). However, this study was conducted in several primary care practices within a managed care organization and cannot be reliably generalized to the SMI population.

Conversely, in Gillispie and colleagues' (2005) study of 121 AA psychiatric inpatients, race was not identified as a critical influence in the patient-provider relationship. Instead, perceived empathy and outreach by the provider was more likely to facilitate follow-up with aftercare in individuals with SMI (Gillispie, et al., 2005).

In one study of 5,983 inpatients with psychotic and mood disorders, cultural matching between the patient and provider produced the same diagnostic disparities as those with unmatched subjects (Mathews et al., 2002). AAs were diagnosed with schizophrenia (26.3% versus 19.8%) and schizoaffective disorder (15.2% versus 9.4%) more than Whites (Mathews et al., 2002). In two studies by Trierweiler and colleagues (2005, 2006) that looked at rates of diagnosis based on clinician race, differences were noted in the attributions and predictors of schizophrenia diagnosis. In a study of 234 inpatients, AA clinicians were less likely to diagnose mood disorders in AA patients than non-AA clinicians (OR=.358, p=.02) (Trierweiler *et al.*, 2005). This diagnosis was typically associated with a higher level of education in the patient and the attribution of situational factors such as aggressive behavior toward the self or considering the stability or changes in the psychiatric condition (Trierweiler *et al.*, 2005). These situational attributions were more likely to be assessed by AA clinicians, but were not associated with the diagnosis of mood disorders. In another study of 292 inpatients, although rates of schizophrenia diagnosis were equal between AA and non-AA clinicians, AA clinicians were more likely to diagnose schizophrenia when hallucinations were present (OR=32.39, p=<.001) and non-AA clinicians when negative symptoms were present (OR=8.51, p,.001) (Trierweiler *et al.*, 2006). As previously discussed, the misinterpretation of symptoms might lead to misdiagnosis and inappropriate treatment.

Inadequate information obtained during assessment of patients is cited as another reason for diagnostic disparity between AAs and whites. In a study of 99 individuals experiencing first episode psychosis with no prior history of mental illness, AAs were more likely than Whites to have diagnostic disagreement from the psychiatric emergency service (PES) diagnosis to the subsequent structured interview (Strakowski et al., 1997). The collection of inadequate information in the PES interview is believed to be the cause of this, especially among AAs. Delahanty and colleagues' (2001) study findings support this conclusion. In this study of 123 inpatients with schizophrenia and depression, the average line length for an admission note for Whites was 18.4 lines compared to only 12.9 lines for AAs.

One method of addressing racial bias in diagnosis used by researchers was blinding interviewers to race. Strakowski and colleagues (2003), in a study of 195 inpatients with psychotic symptoms, found that unblinded interviewers were significantly more likely to identify first rank symptoms or auditory hallucinations in AAs whereas blinded experts found no ethnic differences. Diagnostic inconsistencies were found between blinded and unblinded interviewers when symptoms were similar, but only unblinded interviewers made more diagnoses of schizophrenia spectrum disorders in AA patients even though 79 of the 195 subjects met criteria for affective disorders (Strakowski et al., 2003). This was more common for males at a rate of 47% to 12% for AA and White males, respectively. The rate for White females was 13% and 14% for AA females. As a result, some researchers conclude that clinicians might be prone to attach greater weight to psychotic symptoms in AAs and less weight to mood symptoms when making diagnostic decisions (Giles *et al.*, 1998; Strakowski et al., 2003; Trierweiler et al., 2000).

With regard to treatment disparities, provider's beliefs in stereotypes of violent behavior, particularly in AA males, can contribute to unnecessary hospitalizations. Whaley (2004a), in a study of 180 AA and white men who were well or diagnosed with a (nonspecified) mental disorder, found that AA men were 3.54 times more likely to be hospitalized for mental health problems than were White men.

Need

Stress

Spitz and colleagues (1997) found that AAs with schizophrenia have significantly higher creatine kinase levels than Whites with schizophrenia, which they attribute to the presence of chronic psychological stress. Kessler & Neighbors (1986) also found higher levels of psychological distress in AAs when compared to Whites in the general population, that they attribute to low-income status. Although Kessler & Neighbors (1986) study is not based on a mentally ill population, it is relevant because AAs with SMI, due to the higher number of stressors related to multiple identity status, are likely to experience even greater psychological distress than AAs in the general population related to these factors. In addition, Grella and Stein (2005) also reported that AAs had greater levels of reported psychological stress, but were less likely to receive (substance abuse) treatment in settings that offered mental health services. The combination of stressors resulting from low-income status and other environmental stressors has been linked with physical illness in AAs (Williams & Lawler, 2001) and might contribute to other health disparities.

Diagnosis

Though having a psychiatric diagnosis might be considered a predisposing characteristic according to the BMVP, it can also be an indicator of need for services. Individuals who are diagnosed with a severe mental illness, i.e. schizophrenia, bipolar affective disorder, or recurrent major depressive episodes can be expected to require a certain amount of services. Diagnosis can affect both service use and treatment according to the literature.

African Americans, particularly men, are more likely to be diagnosed with schizophrenia than Whites at rates ranging from 9-32%; and in contrast, Whites are more likely to be diagnosed with major depressive disorder or bipolar affective disorder than AAs at rates ranging from 7-33% (Barnes, 2004; Butterfield *et al.*, 2004; Mark *et al.*, 2003; Mathews *et al.*, 2002; Neighbors *et al.*, 2003; Strakowski *et al.*, 1996a; Strakowski *et al.*, 2003; Trierweiler *et al.*, 2000). African Americans admitted to state psychiatric hospitals are more than five times as likely to receive a schizophrenia diagnosis when compared to Whites (Barnes, 2004). This disparity might be linked to the presentation of both psychotic and depressive symptoms in AAs with SMI as well as psychotomimetic symptoms produced by substance use.

Psychiatric Symptomatology

Paranoia. Several investigators have examined the relationship between specific symptoms and a diagnosis of schizophrenia in AAs. Paranoia as a symptom is prominent in this discussion. In a study of individuals diagnosed with schizophrenia-like disorders and depression in a New York community, Whaley (1998) compares symptoms, particularly paranoia, between the mentally ill group and a control group of college students and adults who did not finish high school. Because paranoia at the mild end of the continuum was more likely to be present in AAs when compared with whites independent of psychiatric status, Whaley (1998) concluded that mild paranoia is a manifestation of “cultural mistrust” rather than psychopathology.

Cultural mistrust is described as a guardedness with those of the dominant culture and is an adaptation to social and economic conditions secondary to the experience of discrimination. Patients with higher levels of cultural mistrust were hospitalized the first time 2.5 years earlier than patients with lower levels of mistrust (Whaley, 2002a). It also varied with education and income, that is, paranoia increased with lower levels of education and income among persons without mental disorders. For AAs with mental disorders, mild paranoia or cultural mistrust can influence the severity of other symptoms, and thus, contribute to the overdiagnosis of schizophrenia in AAs.

In a study of 156 AA psychiatric inpatients, Whaley (2002c) found that paranoid thought, depressed mood, and pressured speech predicted a diagnosis of schizophrenia. However, affective disorders were predicted only by depressed mood.

Depressive Symptoms. With regard to positive (hallucinations and delusions) and negative (social withdrawal and lack of motivation) symptoms of schizophrenia, multiple studies have shown that there are no significant differences in their occurrence between AAs and Whites (Neighbors et al., 2003; Strakowski, et al., 1996). However, in a descriptive, cross-sectional study of 123 AA and White psychiatric inpatients in an inner-city community, AAs with schizophrenia were eight times less likely to have depression or depressive symptoms detected than Whites (Delahanty et al., 2001).

There is limited information in the literature that addresses racial and ethnic disparities in the recognition of depressive symptoms among the SMI, but there are multiple studies conducted in primary care settings and among the general population that may have relevance to this discussion. Diala and colleagues (2001) in the National Comorbidity Survey (N=8,098) and Oquenedo and colleagues (2001) in the Epidemiologic Catchment Area Survey (N=20,514) conducted in multiple sites throughout the United States found similar rates of major depressive disorder or depressive symptoms between AAs and Whites in the general population.

Brown and colleagues (1999), Diala and colleagues (2001), and Oquendo and colleagues (2001) also found similar rates of depressive symptoms between AAs and whites. However, another primary care study (N=204) found that although AAs screened positive for depressive symptoms, they were less likely to meet the DSM-IV criteria for major depressive disorder (Rollman et al., 2002). Jonas and colleagues (2003) in a study of 7,667 men and women between the ages of 17 and 39 found a difference in the rates of various mood disorders including major depressive disorder and dysthymia, where Whites were more likely to receive a diagnosis of major depressive disorder and AAs were more likely to receive the less severe diagnosis of dysthymia. There are several possibilities that may contribute to the disparity in diagnosis of major depressive disorder in AAs when compared to Whites.

For example, in a study of 272 non-substance using AAs and Whites in a primary care practice, AAs were found to report more severe physical symptoms of depression, such as insomnia, psychomotor retardation, decreased appetite, and weight loss as compared to overt reports of depressed mood (Brown *et al.*, 1996). In another study of 661 AA and White primary care patients, AAs were more likely to have depression detected if there was a co-morbid medical condition for which they were seeking care (Borowsky et al., 2000). This finding could indicate either (a) that the provider spends more time with the patient assessing the co-morbid medical condition, thus increasing the likelihood of detecting mood symptoms, or (b) that AAs are more inclined to identify with and seek care for medical complaints than psychiatric concerns.

One study identified age-related diagnostic differences. In Dunlop and colleagues' (2003) study of 7,690 AA, Latino, and white middle-aged adults (aged 54-65), AAs reportedly had a higher prevalence of major depressive disorder than Whites. This sample, however, included individuals who were privately and publicly insured. Since subjects within these groups vary widely with regard to income, access to care, education, and overall health status, to analyze data without controlling for these influences might be invalid. In Zhang & Snowden's (1999) study of 18,152 AA, Latino, Asian, and white community dwelling individuals with mental illness, lower rates of major depressive disorder were found, but similar rates of schizophrenia and bipolar affective disorder between AAs and Whites. Despite including participants over the age of 64, the diagnosis of major depressive disorder remained relatively low in AAs, thus contradicting Dunlop's study, but also making it difficult to compare rates of illness across the aforementioned studies, that were comprised primarily of younger adults.

Substance abuse and psychopathology. Substance abuse is another factor that can complicate the clinical presentation of mental illness. In a study of 122 AA and White individuals diagnosed with schizophrenia, individuals with histories of substance abuse were found to have significantly higher mean scores on depression and anxiety symptoms (according to the Positive and Negative Symptom Scale) as compared to those without histories of substance abuse (overall score 36.4 and 31.2, respectively) (Scheller-Gilkey *et al.*, 2003). More importantly, with regard to the diagnosis of schizophrenia, a study of 195 AA and White inpatients diagnosed with schizophrenia spectrum disorders, substance use was found to be associated with the presence of first rank symptoms such as auditory hallucinations. This category of symptom was found to be significantly associated with the diagnosis of schizophrenia spectrum disorders in 47% of AAs but only 12% of White patients (Strakowski et al., 2003). In a study (N=443) of diagnostic change from bipolar affective disorder to schizophrenia, AAs who used substances (57.1% alcohol and 46.7% other drug) were more likely than Whites (20.0% alcohol and 25% other drug) to have this diagnostic change (Chen et al., 1998). The impact of substance abuse was so significant in another study of 292 AA and non-AA inpatients with schizophrenia that the racial disparities found in the diagnosis of schizophrenia were no longer significant after controlling for it (Trierweiler and colleagues, 2000).

In a study of greater than 4,000,000 subjects, the most prevalent diagnosis for AAs was psychosis (Bolden & Wicks, 2005). The presence of psychosis can also affect hospitalization rates. In Prince's (2007) longitudinal study of 307 adults diagnosed with schizophrenia or schizoaffective disorder, the severity of psychosis was associated with a higher number of hospital admissions. In summary, symptoms such as paranoia, depressed mood, and hallucinations are clearly relevant to the diagnosis of schizophrenia. However, the treatment setting in which patients are seen also appears to play a role (Hampton, 2007). Patients who are highly symptomatic due to delays in treatment or acute intoxication when evaluated in emergency or inpatient settings, do not have the opportunity to be reevaluated in outpatient treatment if follow-up does not occur.

Mental Health Service Utilization

Use of Services

The most common type of admission for AAs in a nationwide sample was the emergency department (Bolden & Wicks, 2005). And AAs were twice as likely as Whites to have been hospitalized four or more times (Prince, 2007). When hospitalized, AAs with SMI also tended to have longer lengths of stay than Whites with SMI (5.5 vs. 4.9 days, respectively) (Bolden & Wicks, 2005).

Conversely, AAs used outpatient services less or for a shorter duration than Whites (Ojeda & McGuire, 2006; Kuno & Rothbard, 2005), except for in an Assertive Community Treatment (ACT) study in which the AAs receiving ACT had higher use of outpatient substance abuse services and lower use of emergency services than Whites (Lehman, et al.,1999). In the non-ACT control group, service use between AAs and Whites was consistent with the previous studies.

Several researchers have considered factors that encourage or block help-seeking behavior among AAs with SMI or their families. The establishment of trust is important particularly for those who experience cultural mistrust or paranoia as described by Whaley (2004a), who states that AAs with SMI may avoid seeking services due to this lack of trust. Individuals and their caregivers who experience restrictive treatment may also be less likely to seek care. Family members of persons with untreated psychosis in first episode schizophrenia, who feared racial discrimination and the adverse effects of psychotropic medication use, were less likely to seek care for their mentally ill family member (M. T. Compton et al., 2004).

Further evidence of this reluctance to seek treatment is reported by Mark and colleagues (2003) who found that AAs have a higher age of onset of illness in comparison to Whites. Though the data for this study were gathered by participant interview and medical record extraction, the method for determining the age of illness onset is not specified. If subject report was used, this conclusion might be valid, however, if the data were extracted from the medical record, this might also indicate delayed treatment seeking. This information could not be determined without participant or family member interview.

More recently, Compton and colleagues (2006) conducted a retrospective study of 25 AAs with first episode psychosis. In this study, the majority of patients did not see a professional until after the onset of psychosis with an approximately 33-week duration of untreated psychosis (Compton, et al., 2006). Bolden and Wicks (2005) postulated that this delay in seeking care is responsible for more severe illness at the point of service contact resulting in longer lengths of stay for AAs in inpatient settings. Delays could also, however, reflect barriers to seeking care. In Evans and colleagues (2004) and Ojeda

& McGuire's (2006) studies, participants reported difficulty in accessing the services they needed, i.e. inconvenient office hours and long waiting periods for appointments.

For AAs who seek care, response to treatment might also be an issue. In studies of patients with schizophrenia (Bae et al., 2004) and major depressive disorder (Brown et al., 1999), AAs showed a slower rate of improvement during treatment. Over time, however, AAs respond to treatment with improvement in symptoms similar to Whites (Bae et al., 2004; Baker et al., 1999; Miranda et al., 2003; Rollman et al., 2002). Though this delayed response to treatment is likely related to the time it takes to establish trust, it is possible that providers become frustrated with the length of time it takes to see improvement, view the delay as treatment failure, or perceive the patient as non-adherent.

Treatment

One of the mainstays of treatment for individuals with severe mental illness is pharmacotherapy. Its importance is reflected in the large number of studies that addressed this treatment modality in terms of prescriptive practices and medication adherence.

Prescription of antipsychotics. Disparities in prescriptive practices of psychotropic medications, particularly in dosage and adherence are well documented in the literature. Atypical antipsychotics, introduced in the 1990's, are a new generation of neuroleptics that are effective in treating both positive (hallucinations and delusions) and negative (affective flattening and social withdrawal) symptoms of schizophrenia while producing fewer undesirable side effects including extrapyramidal symptoms, tardive dyskinesia, and anticholinergic side effects (Shen, 1999).

It is believed that the reason these agents are able to address more symptoms of schizophrenia than conventional antipsychotics (that only address positive symptoms) is their antagonism of serotonin *and* dopamine receptors compared with only dopamine for conventional antipsychotics (Shen, 1999). The evidence strongly suggests that the efficacy of atypical antipsychotics, such as clozapine, risperidone, and olanzapine, are superior to conventional agents (primarily haloperidol used in comparison studies) in terms of number of days spent in the hospital, adherence, symptom improvement, side effects, and substance abuse (Opolka et al., 2003; Mojtabai, et al., 2003).

Although there was one study that found no significant differences in efficacy between the atypical antipsychotics olanzapine, risperidone, quetiapine, and ziprasadone compared with the conventional agent, perphenazine, in this study of 1,493 patients diagnosed with schizophrenia, 74% of enrolled subjects discontinued therapy (Lieberman, et al., 2005). In addition, subjects that were most likely to continue therapy during the study were those that were taking atypical agents prior to the initiation of the study.

Although atypical agents have been associated with metabolic syndrome, i.e. obesity, insulin resistance, dyslipidemia, and hypertension (Newcomer, 2007), they are still considered a first line of treatment. DeHert and colleagues (2006) outlined clinical practice guidelines regarding screening and management of weight, blood glucose, lipids, and blood pressure to decrease morbidity associated with the use of atypical agents. Despite the evidence to support their use, AAs remain less likely to receive these atypical antipsychotics.

Findings of multiple studies indicate that AAs receive conventional antipsychotics at rates ranging from one and a half to three times the rates of Whites who are receiving atypical antipsychotics in the same treatment settings (Copeland et al., 2003; Covell *et al.*, 2002; Fleck *et al.*, 2002; Herbeck *et al.*, 2004; Kreyenbuhl *et al.*, 2003; Kuno & Rothbard, 2002; Mark et al., 2003; Opolka et al., 2003; Opolka *et al.*, 2004; Valenstein *et al.*, 2001a; Valenstein *et al.*, 2001b; Valenti *et al.*, 2003). Mark and colleagues (2002) study of 752 AAs and Whites diagnosed with schizophrenia spectrum disorders reported that AAs received atypical antipsychotics less than Whites. Though race was not indicated specifically as a factor in prescriptive decisions, studies have shown that factors considered in these decisions appear differentially between AAs and Whites.

For example, Mark and colleagues' (2003) study of 2,239 patients with schizophrenia spectrum disorders in inpatient and outpatient care, reported that physicians who were surveyed reported a higher likelihood of prescribing conventional antipsychotics if positive symptoms, such as aggression or violence, are present (rates not given). If AAs are believed to exhibit more positive symptoms, this might explain the disparity in the use of atypicals. Factors that place AAs at greater risk of receiving the less favorable conventional antipsychotics include male gender (Herbeck et al., 2004; Opolka et al., 2003; Opolka et al., 2004), substance abuse (Kuno & Rothbard, 2002; Opolka et al., 2003; Valenti et al., 2003), use of depot antipsychotics (Kuno & Rothbard, 2002), and being uninsured (Herbeck et al., 2004).

In contrast, findings of one study indicated that prescription rates of atypical antipsychotics were equal for AAs and Whites (Woods et al., 2003). This finding at a

Veterans Administration facility was attributed to the implementation of a quality improvement program that emphasized the promotion of evidence-based practice.

Dosage of antipsychotic drugs. Substantial differences in antipsychotic medication dosage have been reported between AAs and Whites with SMI. A number of researchers reported that AAs as compared to Whites are prescribed significantly higher doses of antipsychotic medications (Chung et al., 1995; Diaz & De Leon, 2002; dosReis *et al.*, 2002; Valenstein *et al.*, 2004; Valenstein et al., 2001a; Walkup *et al.*, 2000). This finding might be related to the higher likelihood of AAs to receive antipsychotics by depot injection (Covell et al., 2002; Kreyenbuhl et al., 2003; Kuno & Rothbard, 2002; Mark et al., 2003; Woods et al., 2003). In two studies, the use of depot antipsychotics was associated with doses in excess of recommended guidelines (Valenstein et al., 2001a; Walkup et al., 2000). The reason why AAs with SMI receive depot antipsychotics more than Whites is unknown, but one indication for the use of depot medications is (actual or perceived) poor adherence to oral medication (see *Adherence to antipsychotic prescriptions* below).

Very few studies indicate no statistically significant differences in antipsychotic medication dosage between AAs and Whites with SMI. One study of 204 inpatients diagnosed with schizophrenia found no significant difference between AAs and Whites in antipsychotic dosage after adjusting the dose for the patient's weight (Ruiz *et al.*, 1999). In another study of 440 outpatients with schizophrenia and schizoaffective disorder, there were no statistically significant differences identified between AAs and Whites in antipsychotic dosage, despite a three times higher rate of depot use in AAs (Kreyenbuhl et al., 2003). These few studies are slightly more recent than the studies that found no dosage difference between AAs and whites with SMI. This might indicate that at least in this regard, practices could be equalizing between AAs and Whites with SMI.

Adherence to antipsychotic prescriptions. Prescriptive practices could be driven by provider's beliefs about patient adherence. The literature related to adherence to antipsychotic medications among AAs and Whites with SMI is mixed. One study of 58 patients experiencing first-episode mania followed subjects from inpatient care to the community. This study concluded that AAs diagnosed with bipolar affective disorder had poorer medication adherence than Whites for both conventional (haloperidol and perphenazine) (59% versus 45%) and atypical antipsychotics (risperidone, olanzapine, and quetiapine) (74% versus 58%) even after controlling for alcohol and substance use (Fleck et al., 2002). This study's generalizability is limited, however, by the sample size (only 24 AAs) and the limitation of the study to individuals diagnosed with bipolar affective disorder. Another sample of 50 adults diagnosed with bipolar affective disorder reported there were no differences in adherence between AAs and Whites (Fleck and colleagues, 2005). Adherence was poor in general among both racial groups (50%) and was related to poor insight and physical and cognitive side effects (Fleck, et al., 2005).

Rosenheck and colleagues' (2000) study of 423 inpatients with schizophrenia found that AAs were less likely to adhere to regimens using both haloperidol and clozapine than Whites, but participants stayed in the trials for clozapine approximately eight weeks longer than haloperidol. For AAs taking clozapine who withdrew from the study, weight gain was cited as the reason for withdrawal (25% for AAs and 15% for whites). Once this covariate was controlled in analyses, ethnic differences in adherence were no longer significant.

Alternatively, Valenstein and colleagues' (2004) study of prescription refills for greater than 49,000 AAs and whites diagnosed with schizophrenia spectrum disorders in outpatient care found that AAs had an odds ratio of 2.38 for poor adherence when compared with whites. There were no significant differences in adherence by type of antipsychotic in this study. In a study of 1,637 Veterans Administration patients diagnosed with schizophrenia spectrum disorders, it was found that while there were no significant differences in estimated levels of compliance between AA and White patients during the previous year, providers were more likely to believe that White and older patients were more compliant than AA or younger patients (Valenstein et al., 2001b). This indicates that in treatment practices, provider perceptions of adherence might contribute to ethnic disparities in prescriptive practices.

Gaps in Knowledge

In studies addressing the predisposing, enabling, and need characteristics associated with racial disparities in mental health care, there are some overarching gaps in the literature that fall into four major categories: (a) representation of AAs with SMI in mental health research, (b) influence of location or setting on diagnosis, treatment, and health service utilization, (c) meaning of race, and (d) research design and method issues. See Table 2.1 for a summary of the major studies related to the differences between AAs and Whites among the SMI population.

Representation of African Americans with SMI in Mental Health Research

Multiple identity status, particularly being AA and SMI, has the potential to have a negative impact on health. The consequences, however, are unknown because to date multiple identity status has not been studied at length by any investigator. Excluding studies of the SMI with exclusively AA samples among the studies in this review, the average percentage of AAs with SMI included in the sample was 27.8% for outpatient settings, 32.3% for primary care settings, and 50.3% for inpatient or acute care settings. Because chronic conditions are best managed in outpatient care, acknowledging that AAs with SMI are most frequently seen in acute care indicates that their care is less likely to be comprehensive and more likely to be restrictive in terms of involuntary commitment and possibly with regard to the use of seclusion and restraints.

Influence of Location and Setting on Diagnosis, Treatment, and Health Service Utilization

Findings from two studies indicate that there are no differences between AAs and Whites in inpatient admissions (Barrio *et al.*, 2003a; Mark et al., 2003). These studies, however, are based on the same data set from the Schizophrenia and Assessment Program, a study that mixed subjects from private and publicly funded systems of care. The care received in these systems and the level of acuity of patients served in each can be drastically different, making results difficult to generalize.

A review of the literature indicates location or setting can influence diagnosis, treatment, and subsequently, outcomes of AAs with SMI. The three most commonly used sites for the delivery of mental health services are inpatient or emergency department, outpatient, and primary care. Primary care site studies dealt exclusively with major depressive disorder and its detection and management. Outpatient site studies covered a wide array of mental health disorders, including schizophrenia spectrum disorders, bipolar affective disorder, and major depressive disorder. One study did not identify any specific mental health disorders.

The studies that found fewer diagnostic discrepancies and more similar symptom profiles were more likely to have been conducted in an outpatient setting. This indicates that once individuals are assessed when they are stabilized, racial disparities may be lessened. From the studies obtained in this review, it appears that the inpatient studies, where patients are more likely to be in acute crisis, are the main sources of information about AAs with SMI and may present an exaggerated view on the experience of mental illness in this community. Based on this observation, it is important for future research to include efforts to oversample AAs with SMI in community based research studies, or to further investigate their low rate of outpatient service utilization.

Meaning of Race

Advancements in science brought about by the Human Genome Project and other genetic studies conclude that there is very little genetic basis upon which to differentiate groups by race (Paabo, 2001). The definition of race has evolved over time to reflect these advances from a purely biological foundation to a sociocultural one that reflects the ways in which individuals are treated differentially based upon physical appearance or group affiliation (Byrd & Clayton, 2003). Therefore, disparities in diagnosis, treatment, and outcomes in healthcare are more likely to be associated with other factors, such as SES, that are unrelated to the concept of virtually nonexistent biological differences.

A major gap in the literature reviewed is related to race—its theoretical and operational meanings, method of determination of participants' race, and the importance of the race of the clinicians making diagnostic decisions. Of the two studies that included an operational definition of race, race was defined by continent of origin (Europe versus Africa) and distinguished by black identification (Strakowski et al., 2003) and as any participant who selected the option of "Black/African American" on a survey question (Mark et al., 2003). Five other studies also reported that race was self-identified by the participants (Giles et al., 1998; Miranda et al., 2003; Neighbors et al., 2003; Neighbors et al., 1999; Rollman et al., 2002) and one reported that the ethnicity of the subjects was determined by interviewer observation (Fabrega *et al.*, 1988). The measurement of race was often not reported in the majority of the studies reviewed, even when racial disparity was the primary focus of the study. Knowledge of how race is determined in a sample is important because to omit it is to assume that the AA population is homogenous.

Investigators referred to racial groups in a number of ways. In one study, AAs and Latinos were combined in one group (Brekke & Barrio, 1997). In another study, AAs, Afro-Caribbeans, and black Hispanics were combined in one group, although there were significant clinical differences found between the Caribbean and American blacks (Mark et al., 2003). In yet another, all non-AA groups were combined in one group (Trierweiler et al., 2000). Combining various racial groups, where subjects have different cultures, belief systems, practices, and histories, defeats the purpose of attempting to detect disparities particular to one group or another. Only three studies reported the racial identity of the interviewers (Strakowski et al., 1996; Trierweiler, et al., 2005; Trierweiler, et al., 2006), which is necessary to gauge cultural bias that may be present in the person making diagnostic decisions.

Research Design and Method Issues

The majority of study designs were survey, cross-sectional, and retrospective, so implications about cause and effect cannot be determined. Other considerations that were not pervasive, but may have skewed some of the study results are the mixture of inpatient and outpatient service types; inclusion of elderly adults in the sample; small sample sizes that ranged from 42 to 100; overrepresentation of women; use of non-clinicians to determine diagnosis; and the exclusion of individuals with substance use disorders. All of these research design and method issues present challenges to interpreting and generalizing data from these studies.

Conclusions

This study aims to address some of the research design issues discussed. The following study has a prospective design that utilizes a theoretical framework to identify key control variables as well as to direct the analysis. The subjects were recruited at the same level of care and represent a homogeneous sample of adults with SMI in an urban community.

Chapter 3. METHODOLOGY

Research Aims

The overall goal of this study is to determine if AA race compared to White race predicts differences in mental health service utilization over twelve months among a community sample of individuals with SMI above and beyond other variables, including study group in this secondary analysis of a randomized controlled trial. The specific aims of this study are to use the BMVP to:

1. examine differences between AAs and Whites with SMI with regard to mental health service utilization:
    a. number of crisis services used
    b. number of inpatient services used and
    c. number of residential services used

    controlling for predisposing, enabling (including treatment group), and need variables and vulnerable characteristics.
2. examine differences between AAs and Whites with SMI with regard to mental health service utilization on:
    a. time to first crisis readmission
    b. time to first inpatient readmission and
    c. time to first residential readmission

    controlling for predisposing, enabling (including treatment group), and need variables and vulnerable characteristics.
3. examine differences between AAs and Whites with SMI with regard to mental health service utilization on:

a. length of stay in inpatient services
b. length of stay in residential services

controlling for predisposing, enabling (including treatment group), and need variables and vulnerable characteristics.

Research Design

Description of Current Study

This secondary analysis of mental health service utilization has a prospective design. The data measuring potential predictors of service utilization were obtained at baseline. From the point of entry into the parent study, subjects' crisis, inpatient, and residential service utilization were observed for the following12 months. The parent study, "Clinical Trial of Wellness Training," was a randomized controlled trial where subjects were assigned to either usual care in the community (control group) or usual care with Wellness Training (intervention group), a health promotion intervention. This analysis does not test the intervention, however, treatment group will be considered as a covariate to control for any potential influence the intervention might have had on health service utilization outcomes.

Description of Parent Study

The parent study randomly assigned subjects to treatment and followed them over 18 months. Subjects were recruited from four residential crisis programs (RCPs) that provide short-term care for voluntary patients as an alternative to hospitalization, but the actual randomized trial took place after release from the RCP. The inclusion criteria for subjects were: admission to an RCP, no previous enrollment in the study, and the ability to speak English. The exclusion criteria were: a diagnosis of dementia or other cognitive disorder or a diagnosis of adjustment disorder with no previous history of SMI. The purpose of the exclusion criteria was to ensure the population of interest (SMI) was obtained in the sample and that the subjects would be able to provide reliable self-report.

There were 309 subjects enrolled at baseline. Among them, 210 were male and 99 were female. The mean age was 38.2 years (SD 10.1). The 73 AAs and 132 White subjects in the parent study comprised the pool of subjects eligible for inclusion in this study. There were small numbers of Asian, Latino, and subjects that identified themselves as of mixed or other race. Ethnic disparities have been discussed in the literature for these (Asian and Latino) populations as well, but the numbers in this study lacked sufficient power to perform a separate analysis and have therefore been excluded from the study sample. Furthermore, the purpose of this study is to determine specifically, differences between AAs and Whites with SMI.

Human Subjects Research

This study utilized existing data, documents, and records. There was no direct contact with the subjects. All identifiers were removed prior to data collection and analysis for this study and subjects were identified by case number only. Mental health service utilization (MHSU) records were included in the clinical records of all subjects treated in the RCPs. These data included all billable mental health services such as crisis, inpatient, residential, and outpatient services. These data were used with the approval of the Department of Mental Health Services, the clinical director of the RCPs, and signed consents by the subjects. This study was approved by the University of California, San Francisco, Committee on Human Research (approval number: R01 NR05350).

Sample Selection and Size

The pool of potential subjects began with a total of 205 AAs (n=73) and Whites (n=132), all of whom had baseline data collected in interviews. MHSU records included programs and service providers, dates of use, and duration of service use over a period of several years. Subjects were enrolled in the study at different times, so the period of time covered by the study begins with the discharge from the index RCP episode and ends 12 months later. In addition to being White or AA and enrolled in the parent randomized trial, the criteria for inclusion in this analysis were as follows:

Inclusion Criteria

Subjects were included in the study if the MHSU record showed evidence of:

1. continuous service use throughout the 12 months OR
2. service use dates extending to a minimum of 9 months OR
3. open outpatient service episodes and evidence of use of that service from 9 months post RCP discharge or after the 12 month study period

Or if:

4. the subject completed the 12 month and/or 18 month interview or
5. there was documentation by research staff of knowledge of the local whereabouts of the subject at or after the 9-month cutoff.

Exclusion Criteria

Subjects were excluded if:

1. there were no open services on the MHSU record during or after the study period AND/OR
2. there was documentation of the subjects' death or relocation prior to the 9 month cutoff AND

3. there were no successful contact efforts documented AND
4. there were no interviews after baseline and/or six months.

The inclusion/exclusion criteria and cases were reviewed by an expert panel to determine appropriateness for the study. The final sample used for this study included a total of 155 subjects, 59 AAs (38%) and 96 Whites (62%).

Data and Measurement

Data were obtained from baseline interviews that were conducted by one of two research assistants of White race. Additional data were obtained from the Duke University Severity of Illness Scale (a rating of severity of medical comorbidity) and MHSU records. (References for all instruments are cited in the sections that follow.) Baseline data were collected using a structured interview that was administered by trained research assistants (RAs) to record subjects' self-report as well as research staff ratings of functioning. The subsections of the initial interview from which data have been extracted include: demographics, the Quality of Life Interview (QOLI), the Medical Outcomes Survey-Short Form (SF-36), the Addiction Severity Index (ASI), self concept (including self efficacy and the Rosenberg Self-Esteem Scale), and the Global Assessment of Functioning (GAF) scale. Five of the seven subsections, the QOLI, SF-36, Rosenberg Self-Esteem Scale, and GAF are standardized measures and their psychometric properties are listed below. Variables that were categorized as predisposing characteristics are followed by a (P), enabling resources with an (E), and need characteristics with an (N). Outcomes are followed by an (O). Table 3.1 in the Appendix is also divided into these domains and accompanying operational definitions of the variables.

Demographics

The demographic subsection consisted of eight questions. Race (P) was a self-report item where the subject chose from 7 options: non-Hispanic Caucasian, non-Hispanic AA, Hispanic, American Indian, Asian, mixed background/biracial, or other. Age (P), partnership status (P), and education (P) were also included in the data utilized for this study. Gender (P) was reported initially as male, female, and transgender. There were a total of 6 transgender subjects (biological males at birth) who were then included in the female group that was renamed social gender. Psychiatric diagnosis (P) was obtained from clinical records for use as a predisposing characteristic. Treatment group (E), usual care or usual care with wellness training was also recorded. These data were used to determine homogeneity and/or heterogeneity of the subject pool as well as to determine factors that influence the dependent variables. As noted in Table 3.1, the majority of these variables can be categorized as predisposing characteristics with the exception of treatment group that was categorized as an enabling resource.

Quality of Life Interview

The Quality of Life Interview (Lehman, 2000), brief version, is an 86 item instrument intended to assess the quality of life and satisfaction of persons with SMI by assessing 8 domains: living situation, daily activities and functioning, family, social relations, finances, work and school, legal and safety issues, and health. For the purposes of this study, responses to items pertaining to receipt of social security benefits (E), crime victimization (P), number of days spent in jail (P), housing over the past six months (P), family (E) and social support (E) were utilized as covariates pertaining to predisposing and enabling characteristics. Housing, family support, and social support were transformed into dichotomous variables.

Items are typically scored individually on a 7-point likert scale with higher scores indicating greater satisfaction. Reliability of this measure has been demonstrated in a number of studies with Cronbach's alpha coefficients ranging from .60 to .87. Validity of the QOLI was established by comparing similar constructs with Heinrich's Quality of Life scale. These were found to be significantly correlated (Lehman, 2000).

Medical Outcomes Survey – Short Form (SF-36)

The SF-36 measures health related quality of life (Ware, 2000). A single item (transformed from an ordinal to dichotomous variable) pertaining to the subject's overall impression of their health status (N) was used as a proxy of perceived health as a characteristic of need for health services, rather than obtaining an overall score. It is a shortened version of the full length Medical Outcomes Study interview that measures perceived health status. There are a total of 36 items divided into 8 domains: physical functioning, role limitations due to physical functioning, social functioning as it relates to physical health, bodily pain, general mental health, role limitations due to emotional problems, vitality, and general health perceptions. Scores range from a low of 18 to a maximum of 72 with higher scores indicating greater functional impairment (Ware, 2000).

Reliability and validity of the SF-36 have been established. Internal consistency has been reported with Cronbach's alpha coefficients ranging from .65 to .90. Test-retest correlations were significant ($p< .001$) as well. Concurrent validity of the scale was assessed by comparing subscale items of the SF-36 and the Brief Psychiatric Rating Scale

(BPRS). The depression and anxiety subscales of the BPRS correlated significantly with the emotional well-being, social functioning, and role limits due to emotional problems subscales on the SF-36 (Russo *et al.*, 1998).

Addiction Severity Index (ASI)

A portion of the ASI was used. It measures both lifetime and current (past 30 days) substance use in 13 categories of potential substances used (McLellan, 2000). There are 57 items in the scale used in the interview guide. Responses regarding use are recorded in numbers of days or years of use; therefore higher numbers represent more severe use patterns.

Among a sample of homeless individuals identified as substance users, reliability and validity of the ASI were assessed. Intraclass correlations for drug and alcohol use ranged from .66 to .99 indicating a moderate to high level of reliability of the self-report estimates. Concurrent validity was established by comparing selected questions from the major sections with their composite measures. For the drug related items, correlations ranged from .26 to .81. For alcohol related items, correlations ranged from .49 to .86 (Joyner *et al.*, 1996). This is consistent with other findings that subjects are more likely to give accurate reports of alcohol use as opposed to illicit drug use (Chafetz, 1996).

Summary scores of lifetime alcohol and lifetime drug use were calculated based on sums of relevant items identified by the principal investigators. For alcohol use, the sum of the number of years of lifetime use of 1) alcohol for any purpose and 2) number of years of use to intoxication. For drug use, the sum of the number of years of lifetime use for the following substances: heroin, methadone, other opiates or analgesics, barbiturates, other sedatives, cocaine (or derivatives), amphetamines or stimulants, marijuana, hallucinogens, inhalants, or any other drug. These sums were then divided by the subjects' age at baseline to calculate a proxy for lifetime use severity adjusted for age (P). The ratio scores ranged from 0-1.84 for lifetime alcohol use and from 0-3.39 for lifetime drug use. These variables were not normally distributed and skewed to the right. There are no measures of reliability and validity for the ratio items.

Self-Concept

Self-efficacy or perception of the ability to cope (P) with identified health problems was also part of the baseline interview used in this analysis. Subjects were asked to rate their ability to cope with up to three self-prioritized health problems on a scale from 0-100 with 100 representing the greatest ability to cope. This was based on a method used by MacDonald and colleagues (1998) in a study of stress and coping in early psychosis. Cronbach's alpha for this item in the parent study was .70.

The Rosenberg Self-Esteem scale (RSE) is a 10-item likert scale instrument intended to measure global self-esteem (P). Scores range from 1-4 on each item asking the subject to rate their level of agreement with selected statements about feelings of self worth. Total scores range from 10 to 40 with a score of 40 indicating the highest level of self-esteem (Rosenberg, 1989). Reliability of the scale was estimated at .85 in a population of individuals with SMI (Link et al., 2001). Predictive validity was established by comparing the scale to selected items on the Satisfaction with Life Scale pertaining to subjective well being (Schimmack & Diener, 2002). The Rosenberg scale was found to be a significant predictor of subjective well-being.

Global Assessment of Functioning (GAF)

The GAF is a measure intended to assess overall psychological, social, and occupational functioning (N). Scores range from 0-100 on a continuum with higher scores indicating better functioning in those domains (Spitzer *et al.*, 2000).

The intraclass correlation for the GAF was .86 in a study of individuals admitted to an outpatient treatment program indicating an excellent level of internal consistency. Interrater reliability was also high at .99. Validity was examined by comparing the GAF to comparable measures and it was found to be significantly correlated with the Global Severity Index of the SCL-90-R (Symptom Checklist) (r=-.46, p=.005) and the Personality Disorder Index (r=-.38, p=.01) (Hilsenroth *et al.*, 2000). Research assistants received extensive training in conducting this assessment.

Duke University Severity of Illness Scale (DUSOI)

The DUSOI is a checklist intended to quantify the impact of illness on a person at a given time (N). It is meant to measure the impact of all health problems present in an individual and is rated either at the time of consultation by the provider or retrospectively by record review. The parent study used retrospective review. The severity of each health problem is rated on an ordinal scale from 0-4 (with 4 being the most severe) in four parameters: symptom severity, complication severity, prognosis, and treatability. A weighted total score is then obtained ranging from 0-100 with 100 representing the highest degree of severity (Shiels, *et al.,* 1997). This measure was found to be reliable between raters with an intraclass coefficient of 0.43.

Mental Health Service Utilization Records

Data were obtained from MHSU records that included public sector mental health services billed to the Division of Behavioral Health including: acute care and community based services. The MHSU records were verified to be a part of the records of all included subjects and that the dates of the record included the start date of the study and extended to a minimum of 12 months.

Program services were identified and coded into crisis (O), inpatient (O), or residential (O) services utilizing a registry of services reference book provided by the RCP administrator. In the event a program was not listed, the telephone number (provided on the MHSU record) was called to verify the program type. In nearly every case that the service was not located in the service reference book, the program was a board and care home. This type of service was not included as a residential service since no mental health services are provided in these settings. The remaining cases in which a service was not found in the reference book, hospital names were listed followed by the notation “FFSIP.” It was identified in one acute inpatient hospital as being an inpatient service. These services were coded thereafter as inpatient service episodes.

Case management services (E) were also coded. If a service was identified in the service reference book as providing exclusively intensive case management, it was coded as such and dichotomized as having the service or not. Other outpatient programs identified as providing traditional or a mixture of traditional and intensive case management services were coded as “other outpatient” to distinguish from the more intensive service type. The dates that these services were opened were also recorded, so that the length of service in the program could be calculated. These services were also collapsed into a third variable, “any outpatient program”, which was a combination of intensive and other case management services.

When extracting data from the MHSU records (O), printouts were manually reviewed and counts made for number of the number of times the following services were used.

1. day treatment
2. partial hospitalization
3. residential mental health
4. residential substance abuse
5. long term care inpatient
6. acute inpatient
7. mobile crisis and
8. psychiatric emergency service (PES) or crisis stabilization.

Dates (O) were recorded to calculate:

1. length of stay and
2. time to readmission for crisis, inpatient, and residential services.

The number of services used was counted by the number of times the type of service appeared within the 12 month period. When a service episode fell on the 12 month end date of the study period, the days were counted up to and including the last day of the period and it was counted as one episode. The length of stay in residential or acute inpatient care was calculated by subtracting the date before the service opening date from the service discharge date. The average length of stay was also calculated. Time to readmission was calculated by subtracting the date of the index RCP discharge from the date of the first readmission to crisis, inpatient, and residential care.

All children's services (for subjects close to age 18 who might have still been served by some children's services) were excluded. Residential services were collapsed to include residential mental health, residential substance abuse, and long-term care services (since there were only 4 subjects who used long-term care). Mobile crisis and PES/crisis stabilization were also collapsed into one variable, number of crisis episodes.

For some services, two services were billed for the same dates (i.e. RCPs billed for residential and outpatient services simultaneously). For services occurring at the same site on the same dates, the more restrictive level of care was coded as the service type.

For service settings that provided multiple services, including crisis and outpatient services, if a service episode was opened and closed within a 24 hour period, it was considered a crisis contact. For outpatient services, if more than one service was open, the earlier start date was chosen to calculate the length of time the subject was enrolled in outpatient services.

Though the majority of variables represented the predisposing characteristics domain, it is these characteristics that are supported the most in the literature as influential in health service utilization outcomes. Variables to represent the enabling and need domains of the BMVP address family, social, and financial resources; as well as physical and mental health need. Various levels of health service utilization are measured, from outpatient to emergency, thus covering a broad range of influences and outcomes.

Data Analysis

The analysis progressed through several stages. These stages are labeled and detailed in the following sections. The Statistical Package for the Social Sciences (SPSS), version 11.0 and STATA, version 9.2 were used to conduct all analyses. Data were transferred from SPSS to STATA using the STAT/Transfer program. Statistical significance was set at an α-level of .05.

Stage I

The coded data from the MHSU records were extracted manually and then entered into SPSS. Range checks for each variable were conducted. Any discrepancies were reconciled with the original records and corrected if necessary. There were some missing data for certain variables from the parent study. These cases were excluded in the respective analyses.

Stage II

Variables were selected to represent the domains of the BMVP (see Table 3.1 for operational definitions). Race, age, gender, partnership status, education, self-esteem, and self-efficacy represented the traditional predisposing domain. Homelessness, psychiatric diagnosis, ratio of alcohol use/age, ratio of drug use/age, crime victimization, and days spent in jail represented the vulnerable predisposing domain.

The traditional enabling domain was represented by family support and social support measures. The vulnerable enabling domain included receipt of social security benefits, participation in any outpatient program, and treatment group.

Need variables included perceived health, DUSOI summary scores, and GAF scores. And finally, outcomes were measured in terms of number of crisis services, number of inpatient services, number of residential services, total number of days spent in inpatient care, total number of days spent in residential, average length of stay per inpatient service episode, average length of stay per residential service episode, and time to first readmission for each service type (crisis, inpatient, and residential) were selected for initial analyses.

Stage III

The continuous variables were age, education, self-esteem, self-efficacy, ratio of alcohol use/age, ratio of drug use/age, DUSOI score, GAF score, and all MHSU outcomes detailed above. The distributions of these variables were checked for normality using the Shapiro-Wilks test. Overall sample means, standard deviations, medians, and p-values were examined for each independent variable as well as the MHSU outcome variables.

Stage IV

In the next stage of the analysis, the data descriptively for determining the homogeneity or heterogeneity of the racial groups. Because race was a categorical variable, associations between race and other categorical variables (including gender, partnership status, homelessness, psychiatric diagnosis, having a regular primary care provider, amount of family or social support, receipt of social security benefits, participation in any outpatient program, perceived health status, and treatment group) were conducted using chi-square tests. Frequencies, percentages, and p-values were reported.

To examine associations between race and the continuous variables including outcomes, t-tests and Mann-Whitney U-tests were used. The Mann-Whitney U-test is a nonparametric test that is analogous to the t-test and can be used to analyze continuous variables that violate normality assumptions (Portney & Watkins, 2000). Means, standard deviations, medians, and p-values were reported.

Stage V

Bivariate analyses were also conducted to identify associations between categorical variables and dichotomized outcomes (i.e. crisis service use: yes or no and repeated for inpatient and residential). Chi-square tests were again used to test these associations. Furthermore, associations between continuous independent variables and the continuous outcomes were conducted using Spearman correlations. Correlation coefficients and p-values were reported.

Stage VI

After conducting descriptive analyses with the initial set of selected variables, a reduced set of variables was selected for the purposes of achieving the most parsimonious model and limiting the number of variables to acceptable standards for the sample size. Based on the literature review, the results of bivariate analysis, and expert consensus with the dissertation committee and statistician, a set of 11 core independent variables was selected. These variables included: race, gender, age, homelessness, ratio of alcohol use/age, ratio of drug use/age, being a victim of violence in the past six months, receipt of social security benefits, treatment group, participation in any outpatient program, and GAF score.

This core set of independent variables was used in each subsequent analysis for the outcomes of interest. The outcomes selected to proceed in further analyses included: number of crisis services used, number of inpatient services used, and number of residential services used. Total number of days in inpatient care, total number of days in residential care, and time to first crisis, inpatient, and residential readmission were examined descriptively. Service use outcomes were also dichotomized for further analysis.

Stage VII

Each outcome measure was dichotomized including crisis service use, inpatient service use, and residential service use as having occurred or not. Using the set of 11 variables, a logistic regression model was constructed and run in STATA. Adjusted odds ratios, 95% confidence intervals, and p-values were reported. The odds of service use compared to non-service use can be estimated using the following model:

$$\text{logit}(Y)=\textit{natural}\ \log(\textit{odds})=\ln(\pi/1-\pi)=\alpha+\beta X$$

where Y is the occurrence of service use, ln is the natural log, π is the ratio of probability of service use occurring, $1-\pi$ is the ratio of probability of service use not occurring, α is the Y-intercept, and β is the regression coefficient (Peng, et al., 2002).

To achieve a more parsimonious model, the analysis was repeated using backward stepwise logistic regression. With this method, the analysis begins with the full model including all 11 variables. At each subsequent step, the variable with the highest p-value was removed from the model until only variables with p-values that were <.05 remained. Both the full and backward stepwise model results were reported.

Stage VIII

The next step involved preparing for the analysis of the count outcomes. Similar to many health service utilization studies, the outcomes of interest in this study included counts of the number of times services were used and days spent in care, continuous variables. However, because several subjects did not utilize some services, counts had the potential to be heavily weighted at 0 and therefore skewed to the right. Poisson regression was identified as a method of analysis that can be used to analyze count outcomes when the normality assumption is violated (Hardin & Hilbe, 2007b). Negative binomial regression is a variation of Poisson regression that is used when overdispersion (the variance is greater than the mean) of the dependent variable is present in a Poisson distribution (Hardin & Hilbe, 2007a).

Before conducting the analyses, the potential for interactions between race and other independent variables was checked. Interaction terms were calculated (the product of the race variable and each independent variable) and labeled in the dataset. Each independent variable was entered into a Poisson and/or negative binomial regression model with its corresponding interaction term and race for each of the three outcomes, number of crisis, inpatient, and residential episodes. The overall significance of the model was examined. If the p-value for the model that included the interaction term was <.05, the interaction term would have been included as a covariate in subsequent analyses, however, no interaction terms were significantly associated with the outcomes.

Stage IX

Aim #1. To determine if a difference exists in mental health service utilization between AAs and Whites with SMI with regard to the number of crisis, inpatient, and residential services used while controlling for predisposing, enabling, need, and vulnerable characteristics. The null hypothesis is: There are no differences in number of a) crisis, b) inpatient, and c) residential services used between AAs and Whites with SMI.

For each of the three outcomes, a negative binomial regression was conducted in STATA. Negative binomial regression, the more conservative of the two analyses, was conducted first. To check for goodness of fit, the result of the likelihood-ratio test was examined. If the p-value was <.05, this confirmed the appropriateness of the use of the negative binomial analysis. If the p-value was >.05, a Poisson regression analysis was conducted instead. Relative risk, standard errors, 95% confidence intervals, and p-values were reported. Relative risk (RR) was also reported as a percentage derived from subtracting the RR value from 1 and multiplying by 100.

Each analysis was run first excluding non-service users using the full set of variables. The variables in this model that had p-values ≤.15 were entered into the reduced model. For the overall model, χ^2 and p-values were reported. The analysis was repeated using the full set of variables using the entire sample (including the non-service users), followed by the reduced model using the same criteria for the selection of variables. For the overall model, χ^2 and p-values were reported.

The coefficients for Poisson regression can be estimated using the following equation:

$$\ln(r)=a+b_1x_1+b_2x_2+b_3x_3+b_4x_4+\ldots+b_{11}x_{11}$$

where ln is the natural log transformation, r is the estimated mean for an individual subject's number of service episodes given the set of 11 predictors, x represents the value for each of the independent variables, b_1-b_{11} are the estimated Poisson regression coefficients, and a is the estimate of the constant term (Petrie & Sabin, 2005). More information on negative binomial regression can be found in Hardin & Hilbe (2007a).

Aim #2. To determine if a difference exists in time to readmission between AAs and Whites with SMI with regard to crisis, inpatient, and residential mental health services while controlling for predisposing, enabling, need, and vulnerable characteristics. The null hypothesis was: there is no difference in time to readmission to a) crisis, b) inpatient, and c) residential services between AAs and Whites with SMI.

The outcome variables of interest for this analysis were time to first crisis readmission, time to first inpatient readmission, and time to first residential readmission. Data were examined descriptively using t-tests and Mann-Whitney U-tests to compare outcomes among AAs and Whites. Survival analysis was selected for use to determine the difference in time to readmission and the influence of predisposing, enabling, and need variables including race. Means, standard deviations, medians, and p-values were reported.

Aim #3. To determine if a difference exists in mental health service utilization between AAs and Whites with SMI with regard to the length of stay in inpatient and residential services while controlling for predisposing, enabling, need, and vulnerable characteristics. The null hypothesis was: there is no difference in length of stay in inpatient and residential care between AAs and Whites with SMI.

The outcome variables of interest for this analysis were total number of days in inpatient care and total number of days in residential care. T-tests and Mann-Whitney U-tests were used to compare AAs and Whites. The plan for determining the relative influence of predisposing, enabling, and need variables on these outcomes was to use Poisson and/or negative binomial regression as appropriate. Means, standard deviations, medians, and p-values were reported.

Chapter 4. RESULTS

Introduction

The results are organized into two sections: general sample characteristics and hypothesis testing. The sample characteristics contain the descriptive data about the sample as a whole. Racial differences found at baseline are also reported. The hypothesis testing is divided into sections addressing the results for each of the three specific aims. The results of logistic regression are given first, followed by Poisson and negative binomial regressions conducted first excluding subjects that did not utilize services in the 12-month period and then repeated using the complete sample.

Sample Characteristics

Of the 205 AA and White subjects in the original randomized trial sample, 155 met the inclusion criteria for this study. There were 59 AAs (38.0%) and 92 (62.0%) Whites. The mean age was 39.81 (±9.70). Seventy-two percent of the sample was male (n=112) and 92.9% (n=144) were not partnered. There were 32.3% (n=50) of the subjects that were diagnosed with schizophrenia and 67.7% (n=105) diagnosed with bipolar affective disorder, major depressive disorder, or other. The average number of years of education was 11.93.

The distribution of all continuous variables were examined for normality of distribution using the Shapiro-Wilks test. The independent variables with normal distributions included the Rosenberg Self-Esteem scale and the self-efficacy rating. All other continuous independent variables had non-normal distributions including: age, years of education, GAF score, lifetime days in jail, ratio of lifetime drug use, ratio of lifetime alcohol use, years of case management, DUSOI score, and all outcome measures of health service utilization (see Tables 4.1 and 4.2). For descriptive purposes, all bivariate comparisons have been conducted using both nonparametric and parametric tests to account for non-normal distributions.

Table 4.1. Means, Standard Deviations, and Normality Tests for Service Utilization Outcomes, Including Non-Service Users

Variable	Mean (SD)	Median	Shapiro-Wilks Sig.
Residential Episodes (n=155)	1.59(1.73)	1.00	<.0001
Total Residential Days (n=155)	75.79(86.16)	60.00	<.0001
Inpatient Episodes (n=155)	.66(1.14)	.00	<.0001
Total Inpatient Days (n=155)	8.68(23.63)	.00	<.0001
Crisis Episodes (n=155)	1.99(2.83)	1.00	<.0001

Table 4.2. Means, Standard Deviations, and Normality Tests for Service Utilization Outcomes, Excluding Non-Service Users

Variable	Mean (SD)	Median	Shapiro-Wilks Sig.
Residential Episodes (n=105)	2.35(1.62)	2.00	<.0001
Total Residential Days (n=105)	111.89(83.17)	93.00	<.0001
Inpatient Episodes (n=54)	1.89(1.18)	1.00	<.0001
Total Inpatient Days (n=54)	24.93(34.78)	13.00	<.0001
Crisis Episodes (n=97)	3.18(3.01)	2.00	<.0001

Predisposing Characteristics

AAs and Whites were compared on variables in the predisposing characteristics domain. There were no racial differences with regard to age, years of education, self-efficacy, gender, partnership status, diagnosis, lifetime drug use, and lifetime alcohol use (see Tables 4.3 & 4.4). There were 21 subjects (13.5%) with no reported drug use and 9 subjects (5.8%) with no reported alcohol use. There were significant differences between AAs and Whites with regard to the Rosenberg self-esteem score (p=.010), lifetime days in jail (p=.071), homelessness (p=.010), and having been a victim of violence (p=.029). For most of these variables, AAs were disadvantaged when compared with Whites, i.e. AAs were more likely to be homeless and to have been a victim of a violence in the previous six months. However, with regard to self-esteem, AAs scored significantly higher than Whites. The means (838 days for AAs and 49 days for Whites, p=.21) and medians (50 days for AAs and 10 days for Whites, p=.07) for lifetime days in jail varied considerably between AAs and Whites, although neither the t-test nor Mann-Whitney U-test produced a significant result.

Table 4.3. Predisposing Characteristics: Continuous Variables

Variable	Mean(SD)		p	Median		p	Total (N=155)	
	AA(n=59)	W(n=96)		AA(n=59)	W(n=96)		Mean(SD)	Median
Age	40.12(9.04)	39.62(10.13)	.757	41.10	40.59	.767	39.81(9.70)	40.84
Years of education	11.64(2.13)	12.11(3.16)	.319	12.00	12.00	.196	11.93(2.81)	12.00
RSE Total	25.81(5.74)	23.53(5.32)	.013	25.00	23.17	.010	24.34(5.57)	24.00
Ability to Cope	46.53(23.72)	49.27(23.79)	.487	43.33	50.00	.512	48.23(23.72)	45.00
Lifetime days in jail	838.08(1989.96)	438.76(1351.46)	.209	50.00	10.00	.071	598.48(1641.44)	26.50
Ratio of Lifetime Alcohol Use/Age	.63(.44)	.71(.43)	.257	.59	.67	.221	.68(.43)	.66
Ratio of Lifetime Drug Use/Age	.53(.44)	.64(.68)	.227	.43	.46	.726	.60(.60)	.45

Table 4.4. Predisposing Characteristics: Categorical Variables

Variables	African American n(%)	White n(%)	p	Total
Gender			.180	
Male	39(76.0%)	73(66.1%)		112(72.3%)
Female or Transgender	20(24.0%)	23(33.9%)		43(27.7%)
Partner Status			.731	
Partnered	4(6.9%)	5(5.3%)		9(5.9%)
Unpartnered	54(93.1%)	90(94.7%)		144(94.1%)
Diagnosis			.732	
Schizophrenia	20(33.9%)	30(31.3%)		50(30.2%)
BAD, Depression, Other	39(66.1%)	66(68.8%)		105(67.7%)
Homelessness			.010	
Homeless	19(32.2%)	14(14.7%)		33(21.4%)
Not homeless	40(67.8%)	81(85.3%)		121(78.6%)
Victim of Violence			.029	
Victim	21(35.6%)	19(19.8%)		40(25.8%)
Not victim	38(64.4%)	77(80.2%)		115(74.2%)

Enabling Resources

With the exception of treatment group (there were more AAs in the intervention group, p=.05), there were no significant differences between AAs and Whites with regard to most variables within the enabling resources domain. Both racial groups were equal with regard to the length of time enrolled in case management services, receipt of social security benefits, frequency of contact with family and friends, having a regular primary care provider, and access to intensive case management services, or to other outpatient case management services (see Tables 4.5 and 4.6).

Approximately half of the sample (n=83, 53.5%) was receiving social security benefits, indicating this was a largely financially underprivileged group. Less than 30% had regular contact with family and 53.5% had at least weekly contact with a friend or friends. There were a limited number of subjects with access to intensive case management services (n=32, 20.6%), however, a larger number had access to other case management programs (n=130, 83.9%). The mean for the sample overall was 2.18 ± 2.28 years of enrollment in any case management services.

Table 4.5. Enabling Characteristics: Continuous Variables

Variable	Mean(SD)		p	Median		p	Total (N=140)	
	AA(n=51)	W(n=89)		AA(n=51)	W(n=89)		Mean(SD)	Median
Years of outpatient service	2.02(2.37)	2.27(2.24)	.533	1.07	1.07	.734	2.18(2.28)	1.07

Table 4.6. Enabling Characteristics: Categorical Variables

Variables	African American n(%)	White n(%)	p	Total
Treatment Group			.050	
Usual Care	23(39.0%)	53(55.2%)		76(49.0%)
Intervention Group	36(61.0%)	43(44.8%)		79(51.0%)
Social Security			.893	
Benefited	32(54.2%)	51(53.1%)		83(53.5%)
Not benefited	27(45.8%)	45(46.9%)		72(46.5%)
Regular contact with friends			.233	
Yes	28(47.5%)	55(57.3%)		45(29.0%)
No	31(52.5%)	41(42.7%)		110(71.0%)
Regular contact with family			.751	
Yes	18(30.5%)	27(28.1%)		83(53.5%)
No	41(69.5%)	69(71.9%)		72(46.5%)
Regular primary care provider			.616	
Yes	37(62.7%)	56(58.3%)		93(60.0%)
No	22(37.3%)	40(41.7%)		63(40.0%)
Intensive case management			.738	
Enrolled	13(22.0%)	19(19.8 %)		32(20.6%)
Not enrolled	46(78.0%)	77(80.2%)		123(79.4%)
Other outpatient program			.264	
Enrolled	47(79.7%)	83(86.5%)		130(83.9%)
Not enrolled	12(20.3%)	13(13.5%)		25(16.1%)
Any outpatient program			.186	
Enrolled	50(86.2%)	89(92.7%)		139(90.3%)
Not enrolled	8(13.8%)	7(7.3%)		15(9.7%)

Need Characteristics

The DUSOI scores showed no significant differences in severity of illness between AAs and Whites (see Table 4.7), though median scores appeared to differ (AAs median=53.74 and Whites median=58.14, p=.68) and this finding could have been due to chance. AAs had significantly lower GAF scores (34.00 versus 36.50, p=.016), though this is not likely to represent a clinically significant difference. Differences in perceived health were also nonsignificant. AAs and Whites reported their health as good to excellent or fair to poor at roughly equal rates with equal numbers falling on both sides of the health spectrum.

Outcomes

The racial comparisons among outcome variables are listed in Table 4.9. There were no significant differences between AAs and Whites with regard to number of crisis services used, number of inpatient services used, total inpatient days, total residential days, or time to crisis, inpatient, or residential readmission. There was however a significant difference between AAs and Whites with regard to number of residential services used. Whites were more likely to use residential care services. The mean was 1.22±1.51 for AAs and 1.82±1.82 for Whites (p=.035).

Table 4.7. Need Characteristics: Continuous Variables

Variable	Mean(SD)		p	Median		p	Total (N=146)	
	AA(n=58)	W(n=88)		AA(n=58)	W(n=88)		Mean(SD)	Median
DUSOI	54.80(19.21)	52.93(19.35)	.569	53.74	58.14	.680	53.67(19.25)	57.37
GAF	35.46(5.69)	37.49(6.26)	.042	34.00	36.50	.016	36.70(6.11)	36.00

Table 4.8. Need Characteristics: Categorical Variables

Variables	African American n(%)	White n(%)	p	Total
Overall Health			.310	
Good to Excellent	32(54.2%)	44(44.8%)		78(49.0%)
Fair to Poor	27(45.8%)	52(54.2%)		79(51.0%)

Table 4.9. Health Service Utilization Outcomes: Continuous Variables

Variable	Mean(SD)		p	Median		p	Total (N=155)	
	AA(n=59)	W(n=96)		AA(n=59)	W(n=96)		Mean(SD)	Median
No. crisis episodes	2.03(3.15)	1.96(2.63)	.872	1.00	1.00	.596	1.99(2.83)	1.00
No. inpatient episodes	.73(1.20)	.61(1.10)	.545	0.00	0.00	.564	.66(1.14)	0.00
No. residential episodes	1.22(1.51)	1.82(1.82)	.035	1.00	2.00	.023	1.59(1.73)	1.00
Total inpatient days	11.62(32.46)	7.00(16.24)	.242	0.00	0.00	.449	8.74(23.69)	0.00
Average length of inpatient stay	7.78(29.19)	3.49(6.70)	.271	0.00	0.00	.477	5.13(18.79)	0.00
Total residential days	64.29(86.31)	82.92(85.75)	.190	9.00	74.00	.074	75.79(86.17)	60.00
Average length of residential stay	32.91(42.56)	44.50(59.80)	.196	4.50	25.50	.109	40.09(54.04)	23.00
Time to crisis readmission (N=95, AA=33, W=62)	70.70(104.27)	95.08(102.89)	.274	18.00	58.00	.151	86.61(102.96)	42.00
Time to inpatient readmission (N=54, AA=23, W=32)	144.77(131.32)	138.63(114.50)	.856	115.00	98.50	.986	141.13(120.46)	106.00
Time to residential readmission (N=105, AA=35, W=70)	37.20(78.05)	44.56(87.46)	.675	1.00	1.00	.616	42.10(84.13)	1.00

Hypothesis Testing

The following section details the results of hypothesis testing using the following variables: race, age, gender, housing, ratio of lifetime alcohol use/age, ratio of lifetime drug use/age, and victim of violence in the predisposing domain, receipt of social security benefits, any outpatient program, and treatment group for the enabling domain, and Global Assessment of Functioning (GAF) score as the need domain characteristic. Even though it was significant on bivariate analysis, partnership status was not used as a variable since there were only nine subjects who reported having a significant other. Any outpatient program service was also distributed unevenly (only 15 subjects without the service). Unable to use the two variables together in the analyses (per recommendation of statistician, Dr. Bruce Cooper), any outpatient program was considered as most influential on mental health service utilization by the committee, considering its purpose is to reduce acute service use. Each independent variable was checked for potential interactions with race. There were none found and therefore none were included in the following models.

Aim # 1

To examine the differences between AAs and whites with regard to mental health service utilization, the following services were measured: number of crisis, number of inpatient, and number of residential services used.

Number of Crisis Services Used. Mann-Whitney U-tests failed to show any influence of race on number of crisis services used (see Table 4.10). Ratio of lifetime alcohol use/age, housing, enrollment in any outpatient program, being a victim of violence, and gender were other predisposing characteristics that did not appear to exert any influence on number of crisis services used in either Mann-Whitney U-tests or Chi-square tests. Receipt of social security benefits and treatment group assignment were nonsignificant in the enabling domain as well. GAF score was nonsignificant in the need domain. Age and ratio of lifetime drug use were most closely associated with number of crisis services used on bivariate analysis. Subjects who used crisis services were younger than those who did not (p=.042, see Table 4.11). Though the ratio of lifetime drug use/age was higher among crisis service users (p=.072), this did not reach statistical significance.

Regardless of significance, all variables were entered into the logistic regression model (see Tables 4.12 and 4.13). Variables that achieved statistical significance in the full model, included only ratio of lifetime drug use/age (aOR=2.53, 95% CI=1.12-5.68, p=.025). However, when this model is reduced using backward stepwise logistic regression, both ratio of lifetime drug use/age (aOR=2.43, 95% CI=1.18-4.98, p=.016) as well as homelessness (aOR=.44, 95% CI=.19-.99, p=.047) emerged as significant predictors. The homeless were less than half as likely to use crisis services.

Table 4.10. T-tests for Continuous Variables By Crisis Service Utilization

Variable	Crisis		p
	No	Yes	
Age			
Mean(SD)	41.79(10.32)	38.63(9.16)	.050
Median	43.58	39.10	.042
N	58	97	
GAF			
Mean(SD)	37.33(6.3)	36.31(5.99)	.319
Median	36.00	35.00	.377
N	57	94	
Ratio of Lifetime Alcohol Use/Age			
Mean(SD)	.69(.50)	.68(.39)	.804
Median	.65	.66	.865
N	58	97	
Ratio of Lifetime Drug Use/Age			
Mean(SD)	.46(.42)	.68(.67)	.015
Median	.40	.55	.072
N	58	97	

Table 4.11. Bivariate Comparisons for Crisis Service Utilization

Variables	Service Non-Users n(%)	Service Users n(%)	p	Total
Treatment Group			.884	
Usual Care	28(48.3%)	48(49.5%)		76(49.0%)
Intervention group	30(51.7%)	49(50.5%)		79(51.0%)
Homelessness			.064	
Not homeless	41(70.7%)	80(83.3%)		121(78.6%)
Homeless	17(29.3%)	16(16.7%)		33(21.4%)
Any Outpatient Program			.060	
Not enrolled	9(15.5%)	6(6.3%)		15(9.7%)
Enrolled	49(84.5%)	90(93.8%)		139(90.3%)
Victim of Violence			.695	
Not victim	42(72.4%)	73(75.3%)		115(74.2%)
Victim	16(27.6%)	24(24.7%)		40(25.8%)
Social Security			.985	
Not benefited	27(46.6%)	45(46.4%)		72(46.5%)
Benefited	31(53.4%)	52(53.6%)		83(53.5%)
Race			.511	
African American	24(41.4%)	35(36.1%)		59(38.1%)
White	34(58.6%)	62(63.9%)		96(61.9%)
Gender			.973	
Male	42(72.4%)	70(72.2%)		112(72.3%)
Female or Transgender	16(27.6%)	27(27.8%)		43(27.7%)

Again beginning with the full model including all variables, a negative binomial regression was conducted first excluding non-service users (see Tables 4.14 and 4.15). The overall model was significant (χ^2=26.16, p=.006, N=92). Variables that were significant predictors of more crisis services used were gender, ratio of lifetime alcohol use/age, and receipt of social security benefits. Females used 43% fewer crisis services than males (RR=.57, 95% CI=.38-.86, p=.006). (Percentage was calculated by subtracting 1 from the relative risk (RR) and multiplying by 100.) For each one unit increase in ratio of lifetime alcohol use/age, subjects' the number of crisis services used increased by 55% (RR=1.55, 95% CI=1.01-2.38, p=.046). And subjects with social security benefits used 73% more crisis services than those without benefits (RR=1.73, 95% CI=1.20-2.49, p=.003).

In addition to the above variables, age, ratio of lifetime drug use/age, and any outpatient program also had p-values < .15. These variables were entered into the model with gender, social security benefits, and ratio of lifetime drug use/age. The overall p-value for the model dropped to .0007 (χ^2=21.23, N=96). In this model, social security benefits, gender, and ratio of lifetime alcohol use/age remained statistically significant and any outpatient program also became significant. Age and ratio of lifetime drug use/age did not make a significant contribution to the model. The RR changed to 1.79 for ratio of lifetime alcohol use/age (79% more crisis episodes for each one unit increase in ratio of lifetime alcohol use/age) (95% CI=1.21-2.65, p=.003), .65 for gender (35% fewer crisis episodes among females) (95% CI=.45-.93, p=.020), and 1.64 for receipt of social security benefits (64% more crisis episodes for subjects with benefits) (95% CI=1.16-2.32, p=.005). The RR for any case management services was .50 indicating that subjects with any outpatient program had 50% fewer crisis episodes than those without (95% CI=.27-.92, p=.027).

Considering the same model including both service users and non-service users, there is a different result. Including the non-service users, the model is near but no longer statistically significant (χ^2=19.48, p=.053, N=149) (see Table 4.16). Gender (p=.039), ratio of lifetime drug use/age (p=.019), receipt of social security benefits (p=.027), and age (p=.013) were significant covariates. When these variables were entered into the model alone, the model again became significant (χ^2=15.82, p=.003, N=155) (see Table

4.17). Gender was no longer significant as a covariate. However, as the ratio of lifetime drug use increased, crisis service use increased by 51% (RR=1.51, 95% CI=1.08-2.13,p=.017). Similarly, number of crisis services used increased to 61% for subjects with social security benefits when compared to those without (RR=1.61, 95% CI=1.04-2.50, p=.033). Furthermore, for each year increase in age, the number of crisis services used decreased by 3% (RR=.970, 95% CI=.946-.994, p=.013).

Table 4.12. Logistic Regression, Full Model, Crisis Service Use, N=155

Independent Variable	Adjusted Odds Ratio	95% CI		P
*Homeless	.44	.18	1.08	.07
*Victim of Violence	1.01	.42	2.42	.98
*AA	.89	.41	1.89	.76
*Female or Transgender	.96	.41	2.25	.92
Ratio of Lifetime Alcohol Use/Age	.68	.27	1.70	.41
Ratio of Lifetime Drug Use/Age	2.53	1.12	5.68	.025
*Intervention Group	1.39	.66	2.91	.39
*Benefited	1.00	.46	2.17	.995
GAF	.96	.91	1.03	.26
Age	.97	.93	1.01	.09
*Enrolled in any outpatient program	2.30	.69	7.79	.17

*Comparison groups are: not homeless, not a victim of violence, White race, male gender, usual care, not benefited, and not enrolled, respectively.

Table 4.13. Backward Stepwise Logistic Regression, Crisis Service Use, N=155

Independent Variable	Adjusted Odds Ratio	95% CI		p
Ratio of lifetime drug use/age	2.43	1.18	4.98	.016
*Homeless	.44	.19	.99	.047

*Comparison group: not homeless
Variables exiting the model:
Social security, p=.995
Victim of violence, p=.98
Gender, p=.95
Race, p=.75
Ratio of lifetime alcohol use/age, p=.41
Treatment group, p=.44
GAF, p=.28
Any outpatient program, p=.16
Age, p=.07

Table 4.14. Negative Binomial Regression, Full Model, Crisis Service Use, Excluding Non-Service Users, χ^2= 26.16, p=.006, N=92

Variable	RR	Standard Error	p	95% Confidence Interval	
GAF	1.001	.014	.934	.973	1.030
Age	.982	.010	.073	.963	1.002
Ratio of Lifetime Alcohol Use/Age	1.550	.340	.046	1.008	2.383
Ratio of Lifetime Drug Use/Age	1.207	.155	.143	.938	1.533
*AA	1.141	.204	.459	.804	1.619
*Female or Transgender	.571	.117	.006	.381	.855
*Victim of Violence	1.311	.276	.197	.869	1.980
*Enrolled in any outpatient program	.489	.183	.057	.235	1.020
*Intervention Group	.908	.153	.569	.653	1.264
*Homeless	1.045	.255	.858	.647	1.686
*Benefited	1.728	.324	.003	1.197	2.494

*Comparision groups are White race, male gender, not a victim of violence, not enrolled, usual care, not homeless, and not benefited, respectively.

Table 4.15. Negative Binomial Regression, Reduced Model, Crisis Service Use, Excluding Non-Service Users, χ^2= 21.23, p=.0007, N=96

Variable	RR	Standard Error	p	95% Confidence Interval	
Age	.982	.010	.057	.963	1.001
Ratio of Lifetime Alcohol Use/Age	1.791	.357	.003	1.211	2.649
*Female or Transgender	.650	.120	.020	.453	.934
*Benefited	1.641	.291	.005	1.159	2.324
*Enrolled in any outpatient program	.498	.157	.027	.269	.923

*Comparison groups are: male gender, not benefited, and not enrolled, respectively.

Table 4.16. Negative Binomial Regression, Full Model, Crisis Service Use, Including, Non-Service Users, χ^2= 19.48, p=.053, N=149

Variable	RR	Standard Error	p	95% Confidence Interval	
GAF	.986	.019	.446	.949	1.023
Age	.968	.013	.013	.944	.993
Ratio of Lifetime Alcohol Use/Age	1.211	.347	.504	.690	2.124
Ratio of Lifetime Drug Use/Age	1.573	.304	.019	1.078	2.296
*AA	1.167	.284	.527	.724	1.880
*Female or Transgender	.568	.156	.039	.331	.973
*Victim of Violence	1.231	.351	.466	.704	2.153
*Enrolled in any outpatient program	.769	.352	.567	.314	1.886
*Treatment Group	1.059	.248	.808	.669	1.675
*Homeless	.870	.275	.659	.469	1.615
*Benefited	1.734	.430	.027	1.066	2.820

*Comparison groups are: White race, male gender, not a victim of violence, not enrolled, usual care, not homeless, and not benefited, respectively.

Table 4.17. Negative Binomial Regression, Reduced Model, Crisis Service Use, Including Non-Service Users, χ^2= 15.82, p=.003, N=155

Variable	RR	Standard Error	p	95% Confidence Interval	
*AA	.639	.157	.068	.395	1.034
Ratio of Lifetime Drug Use/Age	1.51	.263	.017	1.076	2.127
*Benefited	1.611	.360	.033	1.040	2.498
Age	.970	.012	.013	.946	.994

*Comparison groups are: White race and not benefited, respectively.

Number of inpatient services used. Mann-Whitney U-tests failed to show any influence of race on the number of inpatient services used (see Table 4.18). There were no significant differences between service users and non-service users with regard to age, GAF score, nor ratio of lifetime drug use or alcohol use/age (see Table 4.19). In comparisons of service users and non-service users on categorical variables (treatment group, homelessness, enrollment in any outpatient program, victim of violence, social security benefits, and gender) only any outpatient program and social security benefits significantly influenced the number of inpatient services used. Subjects that were not enrolled in outpatient programs, did not use inpatient services at all (p=.003). Subjects with social security benefits were more likely to use inpatient services.

Table 4.18. T-tests for Continuous Variables By Inpatient Service Utilization

Variable	Inpatient		p
	No	Yes	
Age			
Mean(SD)	39.71(9.95)	39.99(9.32)	.869
Median	40.84	40.73	.873
n	101	54	
GAF			
Mean(SD)	36.90(6.34)	36.32(5.69)	.581
Median	36.00	35.00	.487
n	98	53	
Ratio of Lifetime Alcohol Use/Age			
Mean(SD)	.69(.43)	.68(.45)	.956
Median	.59	.74	.925
n	101	54	
Ratio of Lifetime Drug Use/Age			
Mean(SD)	.54(.56)	.72(.66)	.072
Median	.43	.59	.072
n	101	54	

Again the full model was constructed using all selected variables. They were entered into the logistic regression model (see Table 4.20). Any case management program was dropped from the model by STATA. Only social security benefits achieved statistical significance (aOR=2.20, 95% CI=1.00-4.81, p=.049). However, when the model was run using backward stepwise logistic regression, there were no predictors left in the model that were statistically significant. Social security benefits was the last variable to exit the model with a p-value of .08 (see Table 4.21).

The analysis proceeded with a Poisson regression using the full model. Non-service users were excluded. The overall model (see Table 4.22) was nonsignificant (χ^2=5.65, p=.844, N=53). There were no significant predictors of inpatient service use and none with p-values less than .15. Therefore, there were no variables to enter into a reduced model by the criteria used for crisis. Instead, the 5 variables with the lowest p-values were entered into the model (since there were only 53 subjects for this analysis), GAF score (p=.175), gender (p=.214), victim of violence (p=.280), ratio of lifetime alcohol use/age (p=.302), and ratio of lifetime drug use/age (p=.373). The model (see Table 4.23) remained nonsignificant (χ^2=5.07, p=.407, N=53).

The same model was constructed including both service users and non-service users. This model (see Table 4.24) had a significant result (χ^2=25.91, p=.007, N=149). However, the only variable to reach statistical significance was ratio of lifetime drug use/age (p=.024). For each one unit increase in ratio of lifetime drug use/age, the number of inpatient services used increased 67% (RR=1.67, 95% CI=1.07-2.62). Receipt of social security benefits reached the level of significance for inclusion in the reduced model (p=.122). When these variables were entered into the model (see Table 4.25), the result was also significant (χ^2=9.23, p=.010, N=155). Subjects with social security benefits used 108% more inpatient services than those without benefits (RR=2.08, 95% CI=1.15-3.76, p=.015). As the ratio of lifetime drug use/age increased, the number of inpatient services used increased by 72% (RR=1.72, 95% CI=.1.10-2.70, p=.018).

Table 4.19. Bivariate Comparisons for Inpatient Service Utilization

Variables	Service Non-Users n(%)	Service Users n(%)	p	Total
Treatment Group			.235	
Usual care	46(45.5%)	30(55.6%)		76(49.0%)
Intervention group	55(54.5%)	24(44.4%)		79(51.0%)
Homeless			.142	
Not homeless	75(75.0%)	46(85.2%)		121(78.6%)
Homeless	25(25.0%)	8(14.8%)		33(21.4%)
Any Outpatient Program			.003	
Not enrolled	15(15.0%)	0(0.0%)		15(9.7%)
Enrolled	85(85.0%)	54(100.0%)		139(90.3%)
Victim of Violence			.258	
Not victim	72(71.3%)	43(79.6%)		115(74.2%)
Victim	29(28.7%)	11(20.4%)		40(25.8%)
Social Security Benefits			.017	
Not benefited	54(53.5%)	18(33.3%)		72(46.5%)
Benefited	47(46.5%)	36(66.7%)		83(53.5%)
Race			.616	
African American	37(36.6%)	32(59.3%)		59(38.1%)
White	64(63.4%)	22(40.7%)		96(61.9%)
Gender			.456	
Male	71(70.3%)	41(75.9%)		112(72.3%)
Female or Transgender	30(29.7%)	13(24.1%)		43(27.7%)

Table 4.20. **Logistic Regression, Full Model, Inpatient Service Use, N=155

Independent Variable	Adjusted Odds Ratio	95% CI		p
*Homeless	.60	.21	1.68	.54
*Victim of Violence	.95	.36	2.48	.91
*AA	1.58	.72	3.47	.25
*Female or Transgender	.79	.33	1.93	.61
Ratio of Lifetime Alcohol Use/Age	.98	.39	2.46	.97
Ratio of Lifetime Drug Use/Age	1.80	.96	3.36	.07
*Intervention Group	.79	.38	1.66	.54
*Benefited	2.20	1.00	4.81	.049
GAF	.99	.93	1.06	.77
Age	.99	.95	1.03	.71

*Comparision groups are: not homeless, not a victim of violence, White race, male gender, usual care, and not benefited, respectively.
**Any outpatient program dropped from the model

Table 4.21. Backward Elimination Logistic Regression, Inpatient Service Use, N=155

Independent Variable	Order exited model	p
Ratio of lifetime alcohol use/age	1st	.97
Victim of violence	2nd	.90
GAF	3rd	.76
Age	4th	.70
Gender	5th	.61
Treatment group	6th	.47
Homelessness	7th	.29
Race	8th	.38
Ratio of lifetime drug use/age	9th	.07
Social Security Benefits	10th	.08

Table 4.22. Poisson Regression, Full Model, Inpatient Service Use, Excluding Non-Service Users, $\chi^2 = 5.65$, p=.844, N=53 (*Any outpatient dropped due to collinearity)

Variable	RR	Standard Error	p	95% Confidence Interval	
GAF	.971	.021	.175	.931	1.013
Age	1.004	.013	.731	.979	1.030
Ratio of Lifetime Alcohol Use/Age	.755	.206	.302	.442	1.288
Ratio of Lifetime Drug Use/Age	1.163	.197	.373	.834	1.621
*AA	.999	.233	.996	.632	1.577
*Female or Transgender	.694	.204	.214	.389	1.236
*Benefited	.917	.250	.752	.537	1.566
*Victim of Violence	1.423	.466	.280	.750	2.702
*Intervention Group	.885	.207	.601	.559	1.401
*Homeless	.907	.269	.742	.508	1.621

*Comparison groups are: White race, male gender, not benefited, not a victim of violence, usual care, and not homeless, respectively.

Table 4.23. Poisson Regression, Reduced Model, Inpatient Service Use, Excluding Non-Service Users, $\chi^2 = 5.07$, p=.41, N=53

Variable	RR	Standard Error	p	95% Confidence Interval	
*Victim of Violence	1.2099	.3522	.513	.6839	2.1405
*AA	.9723	.2183	.900	.6261	1.5098
*Female or Transgender	.7156	.2047	.242	.4085	1.2535
GAF	.9690	.0191	.111	.9323	1.0072

*Comparison groups are: not a victim of violence, White race, and male gender, respectively.

Table 4.24. Negative Binomial Regression, Full Model, Inpatient Service Use, Including Non-Service Users, $\chi^2 = 25.91$, p=.007, N=149

Variable	RR	Standard Error	p	95% Confidence Interval	
*Homeless	.6350	.2523	.253	.2914	1.3836
*Victim of Violence	1.2481	.4988	.579	.5702	2.7319
*AA	1.2874	.3893	.403	.7117	2.3288
*Female or Transgender	.6413	.2384	.232	.3095	1.3289
Ratio of Lifetime Alcohol Use/Age	.7826	.2788	.491	.3894	1.5732

Variable	RR	Standard Error	p	95% Confidence Interval	
Ratio of Lifetime Drug Use/Age	1.6747	.3823	.024	1.0706	2.6196
*Intervention Group	.8052	.2332	.454	.4564	1.4206
*Enrolled in any outpatient program	7142859	6.82e+09	.987	0	.
*Benefited	1.6356	.5201	.122	.8770	3.0502
GAF	.9704	.0253	.248	.9220	1.0212
Age	.9967	.0160	.830	.9656	1.0285

*Comparison groups are: not homeless, not a victim of violence, White race, male gender, usual care, not enrolled, and not benefited, respectively.

Table 4.25. Negative Binomial Regression, Reduced Model, Inpatient Service Use, Including Non-Service Users, χ^2= 9.23.48, p=.010, N=155

Variable	RR	Standard Error	p	95% Confidence Interval	
Ratio of Lifetime Drug Use/Age	1.72	.394	.018	1.098	2.696
*Benefited	2.08	.629	.015	1.152	3.764

*Comparison group: not benefited.

Number of Residential Services Used. Mann-Whitney U-tests showed a significant difference between AAs and Whites with regard to number of residential services used (p=.023) (see Table 4.9). In examining the other variables to be included in the model, there were significant differences between residential service users and non-service users with regard to any outpatient program only (p=.020). There were no significant differences between residential service users and non-service users with regard to age, GAF score, nor ratio of lifetime drug use/age or alcohol use/age (see Tables 4.26 and 4.27).

The selected variables were entered into the logistic regression model (see Table 4.28). (Any outpatient program was dropped from the model by STATA.) No variables in the full model reached statistical significance, but when using backward stepwise logistic regression, any outpatient program remained in the final model (aOR=3.79, 95%

CI=1.26-11.37, p=.018). Subjects enrolled in any outpatient program were 3.79 times more likely to use residential services than those who were not enrolled. Race exited the model in the previous step (p=.06) (see Table 4.29).

Table 4.26. T-tests for Categorical Variables By Residential Service Utilization

Variable	Residential		p
	No	Yes	
Age			
Mean(SD)	40.53(9.27)	39.47(9.93)	.526
Median	41.24	40.61	.540
n	50	105	
GAF			
Mean(SD)	36.02(6.54)	37.01(5.90)	.356
Median	35.00	36.00	.444
n	48	103	
Ratio of Lifetime Alcohol Use/Age			
Mean(SD)	.67(.39)	.69(.46)	.833
Median	.70	.67	.878
n	50	105	
Ratio of Lifetime Drug Use/Age			
Mean(SD)	.57(.60)	.61(.60)	.623
Median	.40	.50	.602
n	50	105	

The analysis proceeded with a Poisson regression using the full model. Non-service users were excluded. The overall model was nonsignificant (χ^2=16.85, p=.112, N=102). In this model, ratio of lifetime drug use/age was the only significant predictor (p=.020). Race was nonsignificant (p=.435). Any outpatient program had a p-value less than .15 and was entered into the reduced model with ratio of lifetime drug use/age (see Table 4.30). The resultant model was significant (χ^2=9.87, p=.007, N=105). Only ratio of lifetime drug use/age was a significant predictor of residential service use. For each one unit increase in ratio of lifetime drug use/age, there was a 25% increase in the number of residential services used (RR=1.25, 95% CI=1.04-1.51, p=.018) (see Table 4.31).

Table 4.27. Bivariate Comparisons for Residential Service Utilization

Variables	Service Non-Users n(%)	Service Users n(%)	p	Total
Treatment Group			.227	
Usual care	21(42.0%)	55(52.4%)		76(49.0%)
Intervention group	29(58.0%)	50(47.6%)		79(51.0%)
Homeless			.905	
Not homeless	39(78.0%)	82(78.8%)		121(78.6%)
Homeless	11(22.0%)	22(21.2%)		33(21.4%)
Any Outpatient Program			.020	
Not enrolled	9(18.4%)	6(5.7%)		15(9.7%)
Enrolled	40(81.6%)	99(94.3%)		139(90.3%)
Victim of Violence			.108	
Not victim	33(66.0%)	82(78.1%)		115(74.2%)
Victim	17(34.0%)	23(21.9%)		40(25.8%)
Social Security Benefits			.938	
Not benefited	23(46.0%)	49(46.7%)		72(46.5%)
Benefited	27(54.0%)	56(53.3%)		83(53.5%)
Race			.035	
African American	25(50.0%)	34(32.4%)		59(38.1%)
White	25(50.0%)	71(67.6%)		96(61.9%)
Gender			.665	
Male	35(70.0%)	77(73.3%)		112(72.3%)
Female or Transgender	15(30.0%)	28(26.7%)		43(27.7%)

In the analysis including both service users and non-service users, the negative binomial regression model had a significant result (χ^2=20.01, p=.03, N=149) (see Table 4.32). Any outpatient program was the only variable to reach statistical significance (p=.006). Race (p=.104) and ratio of lifetime drug use/age (p=.109) reached the level of significance for inclusion in the reduced model. When these variables were entered into the model alone, the model was also significant (χ^2=17.57, p=.0005, N=154) (see Table 4.33). Only any outpatient program was a significant predictor of the number of residential services used. Subjects enrolled in any outpatient program used 228% more residential services than those who were not enrolled (RR=3.28, 95% CI=1.43-7.50, p=.005). Race and ratio of lifetime drug use had nonsignficant contributions.

Table 4.28. Logistic Regression, Full Model, Residential Service Use, N=155

Independent Variable	Adjusted Odds Ratio	95% CI		p
*Homeless	1.46	.38	1.75	.54
*Victim of Violence	.64	.26	1.56	.33
*AA	.55	.25	1.19	.13
*Female or Transgender	1.21	.50	2.91	.67
Ratio of Lifetime Alcohol Use/Age	1.29	.51	3.27	.59
Ratio of Lifetime Drug Use/Age	.92	.47	1.81	.81
*Intervention Group	.82	.38	1.75	.60
*Benefited	.95	.43	2.09	.90
GAF	1.03	.97	1.10	.36
Age	.98	94	1.02	.35

*Comparison groups are: not homeless, not a victim of violence, White race, male gender, usual care, and not benefited, respectively.

Table 4.29. Backward Stepwise Logistic Regression, Residential Service Use, N=155

Independent Variable	Adjusted Odds Ratio	95% CI		p
*Enrolled in any outpatient program	3.79	1.26	11.37	.018

*Comparison group: not enrolled
Variables exiting the model:
Social security benefits, p=.90
Ratio of lifetime drug use/age, p=.82
Gender, p=.66
Ratio of lifetime alcohol use, p=.65
Study group, p=.65
Homeless, p=.45
GAF, p=.48
Victim of violence, p=.41
Age, p=.39
Race, p=.06.

Table 4.30. Poisson Regression, Full Model, Residential Service Use, Excluding Non-Service Users, χ^2= 16.85, p=.112, N=102

Variable	RR	Standard Error	p	95% Confidence Interval	
Age	.997	.007	.642	.982	1.011
GAF	.985	.012	.219	.962	1.009
Ratio of Lifetime Drug Use/Age	1.282	.137	.020	1.040	1.581
Ratio of Lifetime Alcohol Use/Age	.972	.158	.861	.706	1.338
*Benefited	1.185	.173	.244	.891	1.578
*Female or Transgender	.830	.139	.268	.597	1.154
*Enrolled in any outpatient program	1.886	.741	.107	.873	4.075
*Intervention group	1.131	.150	.353	.872	1.466
*Homeless	.833	.146	.297	.591	1.174
*AA	.889	.134	.435	.662	1.194
*Victim of Violence	1.166	.194	.355	.842	1.616

*Comparison groups are: not benefited, male gender, not enrolled, usual care, White race, and not a victim of violence, respectively.

Table 4.31. Negative Binomial Regression, Reduced Model, Residential Service Use, Excluding Non-Service Users, χ^2= 9.87, p=.007, N=105

Variable	RR	Standard Error	p	95% Confidence Interval	
Ratio of Lifetime Drug Use/Age	1.254	.119	.018	1.040	1.511
*Enrolled in any outpatient program	1.996	.766	.072	.940	4.236

*Comparison group: not enrolled

Table 4.32. Negative Binomial Regression, Full ModelResidential Episodes, Including Non-Service Users, χ^2= 20.01, p=.03, N=149

Variable	RR	Standard Error	p	95% Confidence Interval	
*Homeless	.945	.210	.800	.612	1.460
*Victim of Violence	1.038	.222	.860	.683	1.578
*Race	.740	.137	.104	.515	1.064
*Female or Transgender	.878	.180	.528	.588	1.313
Ratio of Lifetime Alcohol Use/Age	1.032	.218	.881	.682	1.5601

Variable	RR	Standard Error	p	95% Confidence Interval	
Ratio of Lifetime Drug Use/Age	1.250	.174	.109	.952	1.641
*Intervention Group	1.040	.176	.816	.746	1.450
*Enrolled in any outpatient program	3.280	1.411	.006	1.412	7.622
*Benefited	1.116	.201	.542	.785	1.587
GAF	.994	.015	.682	.966	1.023
Age	.991	.010	.338	.974	1.009

*Comparison groups are: not a victim of violence, White race, male gender, usual care, not enrolled, and not benefited, respectively.

Table 4.33. Negative Binomial Regression, Reduced Model, Residential Service Use, Including Non-Service Users, χ^2= 17.57, p=.0005, N=154

Variable	RR	Standard Error	p	95% Confidence Interval	
Ratio of Lifetime Drug Use/Age	1.23	.159	.104	.958	1.589
*Enrolled in any outpatient program	3.28	1.38	.005	1.43	7.50
*AA	.74	.131	.093	.526	1.051

*Comparison groups are: not enrolled and White race, respectively.

Aim # 2

To determine if a difference exists in time to readmission between AAs and Whites with SMI with regard to crisis, inpatient, and residential mental health service utilization while controlling for predisposing, enabling, need, and vulnerable characteristics.

The means and medians were examined for the number of days to the first readmission for each type of mental health service utilization. T-tests and Mann Whitney U-tests were used to determine if there were significant differences between races on the above measures (see Table 4.9). The overall average time to the first crisis readmission was ~148 days. For the first inpatient readmission, the overall average was ~45 days. And for the first residential readmission, the overall average was ~90 days. There were no differences between races that reached statistical significance for crisis, inpatient, or residential readmission though there appeared to be a large difference between AAs and Whites with regard to crisis readmission, 70.70±104.27 for AAs and 110.97±112.97 for Whites (p=.205). The medians also widely differed at 18.00 for AAs and 58.00 for Whites (p=.136). The mean and median also differed for time to inpatient readmission, though to a lesser degree. For time to readmission for residential services, the medians were identical and the mean was slightly higher for Whites.

The analysis plan for this aim was to conduct a survival analysis to determine the influence of race on time to readmission to crisis, inpatient, and residential services. However, since these differences failed to show significant differences at baseline, the decision was made not to proceed with the survival analysis.

Aim # 3

To determine if a difference exists in mental health service utilization between AAs and Whites with SMI with regard to length of stay in inpatient and residential services controlling for predisposing, enabling, need, and vulnerable characteristics.

Length of stay for inpatient services. The length of stay for inpatient services over 12 months for AAs was 7.78± 29.29 days and 3.49±6.70 days for Whites (p=.271) (see Table 4.9). The medians were identical for both groups at 0.00 (p=.477). Since these were not statistically significant, the analysis for this outcome did not proceed. The mean of the total number of inpatient days for 12 months was 11.62±32.46 for AAs and 7.00±16.24 for Whites (p=.242).

Length of stay for residential services. The length of stay for residential services over 12 months for AAs was 64.29± 86.31 days and 82.92±85.75 days for Whites (p=.190). The medians were 9.00 and 74.00 for AAs and Whites, respectively (p=.074). Again, since these were not statistically significant, the analysis for this outcome did not proceed.

CHAPTER 5: DISCUSSION

The goal of this study was to determine at 12 months, if AA race compared to White race predicted differences in mental health service utilization among a community sample of individuals with severe mental illness above and beyond other variables. There were three aims examining this phenomenon. The first looked at the number of services used at the following acuity levels: crisis, inpatient, and residential. There were some baseline differences in race regarding residential use and the analysis was conducted to identify those influences. However, aims two and three examining time to crisis, inpatient, and residential readmission and length of stay in inpatient and residential services did not proceed beyond descriptive analysis as the data failed to show any significant baseline differences in mental health service utilization with regard to race.

This chapter includes a summary and interpretation of the results, details strengths and limitations of the study, and concludes with nursing implications and directions for future research.

Summary and Interpretation of Results

Predisposing Characteristics

In comparison with much of the literature reviewed on outpatient samples, this study had a high representation of AAs (38%) compared to Whites (62%). All were recruited during an episode of subacute care with hypothetically access to the same range of services over the next 12 months. Within the traditional domain, AAs and Whites were mostly similar at baseline. There were no significant differences in age (age 39.8±9.7), gender (72% male), partnership status (93% unpartnered), or education (year 11.9±2.8). There was a modest difference in self esteem scores, however. AAs scored an average of 25.8±5.7 and Whites 23.5±5.3. In Whaley's (2002b) study of 175 AAs with SMI, homeless AA individuals had significantly higher self esteem scores than those AAs who were not homeless. Though considering this result in the context of the 10-40 range of the Rosenberg scale, these results fall at a mid-point in self-esteem and may not represent a strong clinical significance. However, Whaley (2002b), in his study of 118 AA psychiatric inpatients, found that there was an association between homelessness and self esteem. He proposed that the higher scores were not true reflections of a positive self image, but instead an attempt to project a positive image of themselves to others.

In the vulnerable characteristics domain, there were more differences evident between AAs and Whites. Though the rate of homelessness in the entire sample was 21%, 32% of all AAs were homeless compared to only 15% of Whites (p=.01). AAs were also more likely to report being a victim of violence within the last six months (26% total sample, 36% AAs, and 20% Whites, p=.03). And although the median number of lifetime days spent in jail differed greatly (50 days for AAs and 10 days for Whites), it did not reach statistical significance (p=.07). In the parent study, however, AA race was found to be significantly associated with length of incarceration (mean AAs=794 days, median=47.5 days, mean Whites=362 days, median 5 days, p=.006) (White et al., 2006), indicating that sample size was likely insufficient to detect the difference in this study.

Similar to other outpatient studies of SMI, there was no significant difference found in the rate of schizophrenia diagnosis between AAs (34%) and Whites (31%) (p=.73). There were also no differences in lifetime use of alcohol (p=.22) nor lifetime drug use (p=.73). Less than 6% and 14% of the sample reported no use of alcohol and drug use, respectively, indicating that a large portion are or have engaged in some form of substance use. Drug and alcohol use has been associated with increased hospitalization (Prince, 2007) and less use of outpatient case management services (Lemming & Calsyn, 2004).

These findings indicate that although this sample is mostly homogenous, AAs do have more vulnerability characteristics, particularly with regard to victimization and homelessness. This vulnerability has the potential to influence health service utilization outcomes as demonstrated in Folsom and colleagues (2005) study of 10,340 individuals with SMI (Folsom *et al.*, 2005). Homeless subjects were more likely to be young, AA males, to use emergency, inpatient, and crisis residential services, and less likely to use outpatient mental health services. It is possible that the extreme vulnerability of this group as a whole, might have masked the presence of racial differences that have been reported in other studies.

Enabling Resources

With the exception of treatment group, there were no racial differences evident regarding enabling characteristics. A higher percentage of AAs were assigned to the Wellness Training intervention (in the parent study), however, this physical health intervention was not found to have a significant influence on mental health service utilization outcomes.

Statistically speaking, AAs and Whites were equal with regard to social security benefits (54% of subjects were benefited) and social support (29% had regular contact with family and 54% had regular contact with friends). Sixty percent had a regular primary care provider and 90% were enrolled in some sort of outpatient mental health program. The length of time enrolled in the program was also consistent between races with a total mean of ~2 years and median of ~1 year.

It was interesting to note that only 21% of the sample was enrolled in an intensive case management program. This is similar to Evans and colleagues (2004) study that found only 16% of subjects reported receiving case management services due to perceived lack of access (Evans *et al.*, 2004). Though nonsignificant in this study, there were slightly higher percentages of AAs using the intensive service (22%) compared to Whites (20%). In other types of case management or outpatient programs, AAs used the service less (80% AAs and 87% Whites, p=.26). Fisher and colleagues (2000) study of 192 SMI in the criminal justice system showed that use of case management services was associated with insurance coverage (Fisher *et al.*, 2000). However, even though only half of this sample received public benefits, greater than 90% were enrolled in some sort of outpatient program, either intensive or traditional services.

This reflects that in this system of care, intensive case management is not available to most mental health consumers, but access to traditional case management (where case managers typically have much larger caseloads than those in intensive programs) appears to be equal in this study between races. Overall access to health care resources, social support, and socioeconomic status also appears to be equal as measured in this study.

Although equally distributed, the type of case management service received must be considered. Assertive community treatment (ACT), an intensive case management service model, has been compared to broker type or standard case management. Both types were effective at providing financial services (Morse *et al.*, 1997) and reducing substance use severity (Clark *et al.*, 1998). However, ACT was superior with regard to reducing the number of inpatient days (Lehman *et al.*, 1999; Xie *et al.*, 2004) and AAs use of emergency services (Lehman et al., 1999), decreasing patient attrition (Clark et al., 1998), increasing patient satisfaction (Morse et al., 1997), and increasing the use of outpatient mental health services (Rothbard *et al.*, 2004). ACT patients were also more likely to be seen by case managers as non-ACT case managers often had wait lists of three to four months, resulting in patient drop-out (Morse et al., 1997). ACT also served to equalize service delivery between AAs and Whites, as patients receiving usual care had significant disparities in inpatient service use (Whites used two times as much of inpatient services as AAs), but these differences were not evident in the ACT patients (Lehman et al., 1999).

Need

With regard to need for health care services, the measure used for mental health need was the GAF score assessed at baseline. Scores for AAs were slightly lower (35.5±6.3) than for Whites (37.5±5.7)(p=.04). The range of possible scores was 0-100 indicating that this sample was highly symptomatic with a low level of social and occupational functioning at baseline. Though ratings were made in this study by trained research staff, the difference in GAF scores might also reflect a tendency to view AAs as having more severe psychiatric symptoms than Whites (Arnold, 2004; Brown, et al., 1999).

There were no racial differences on the two measures of medical need: DUSOI and perception of health. For both AAs and Whites, there was a moderate level of need.

The overall mean for DUSOI was 53.7±19.3 (scale 0-100). And approximately half of the group rated their health as good to excellent and the other half fair to poor.

According to the ABM, health service utilization is influenced by predisposing, enabling, and need characteristics (Andersen, 1968). The BMVP proposes the same, also acknowledging the role of competing needs when various vulnerabilities exist (Gelberg *et al.*, 2000). The following details the degree to which these influences affected crisis, inpatient, and residential service use in this sample.

Outcomes

With regard to outcomes, the only statistically significant racial differences were in the number of residential services used (AA 1.22±1.5, Whites 1.82±1.8, p=.04). Whites had a higher number of episodes than AAs and though not statistically significant, also had a higher total number of residential days in 12 months (AA median 9.00, whites 74.0 days, p=.07). This indicates that access to the most acute services, i.e. inpatient and psychiatric emergency care is roughly equal, but less acute services such as residential treatment, might be less accessible to AAs.

The purpose of Aim #1 was to examine the difference between AAs and Whites with SMI with regard to the use of crisis, inpatient, and residential services while controlling for predisposing, enabling, and need characteristics. Analysis of each service type included bivariate comparisons of service users versus non-service users, logistic regression using all predictor variables followed by backward stepwise logistic regression, and finally Poisson or negative binomial regression (as appropriate) conducted using the full model including all predictor variables followed by a reduced model including only those variables with p-values that were less than .15. The analyses were conducted in two ways, first excluding non-service users followed by inclusion of all subjects.

Crisis service use. On bivariate analysis, younger age (p=.05) and higher ratio of lifetime drug use (p=.02) was associated with the use crisis services. This is consistent with Folsom and colleagues (2005) and Hackman and colleagues (2006) studies that found that younger age was associated with crisis or emergency service use. Folsom and colleagues (2005) and Rothbard and colleagues (2004) found a similar association between drug use and the use of these services.

When controlling for other variables in the logistic regression, ratio of drug use (aOR=2.43, p=.02) and homelessness (aOR=.44, p=.05) were significantly associated with crisis service use. These variables remained in the backward stepwise model with race exiting the model fourth after social security benefits, violence, and gender.

In the reduced negative binomial regression model excluding non-service users, male gender (p=.02), higher ratio of lifetime alcohol use (p=.003), having social security benefits (p=.005), and enrollment in any outpatient program (p=.03) were most influential in predicting crisis service use. However in the reduced model including non-service users, the predictors were instead younger age (p=.013) and higher ratio of lifetime drug use (p=.017). This indicates that there might be notable differences in the characteristics of crisis service users (n=92) and non-users (n=63) that must be considered when conducting health services research.

Though drug versus alcohol influence varied by analysis, the use of substances appeared to emerge as a significant influence in the use of crisis services. Homelessness did not emerge as a predictor when controlling for other variables. The predictors are from the predisposing and enabling domains including both traditional as well as vulnerable characteristics. Need did not emerge as a significant predictor of crisis services.

Inpatient service use. Bivariate comparisons revealed differences between users and non users of inpatient services with regard to receipt of social security benefits (p=.02) and enrollment in any outpatient service (p=.003). Ratio of lifetime drug use approached statistical significance (p=.07). Like crisis services, inpatient service use has also been linked with drug use (Prince, 2007).

However, in logistic regression analysis, the full model had only one significantly contributing variable to inpatient service use, having social security benefits (OR=2.20). But on backward elimination, even social security benefits (p=.08) exited the model directly after race (p=.38) and ratio of lifetime drug use (p=.07). Because there were only 53 subjects who used inpatient services, this result might be a reflection of insufficient power to reject the null hypothesis rather than there truly being no difference between service users and non service users.

Similarly, the reduced Poisson model excluding non-service users, failed to yield any significant predictors of inpatient service use. In the negative binomial model including non-service users, the predictors in the reduced model were ratio of lifetime drug use (p=.02) and social security benefits (p=.02). Lundgren and colleagues (2005), similarly found that subjects with private health insurance were twice as likely to use hospital services. For inpatient service use, predictors fell within the vulnerable domain of the predisposing and enabling categories as well. Considering the low numbers of subjects that used this service compared with the nearly double that used crisis services, access appears to be severely limited. The subjects using this service were likely to be severely symptomatic and receiving benefits to cover the cost of the service. Though this type of service is expected to be for those whose acuity is high, the association with ability to pay for the service is concerning because many of the subjects in this sample were without benefits (46.5%) and had high need as evidenced by low GAF scores (overall mean=36.7, scale 0-100).

Residential service use. With regard to bivariate analysis, the number of residential services used was the only service type in which racial differences existed at baseline. Sixty-eight percent of Whites and 32% of AAs (p=.04) used this type of service in a 12-month period. Individuals enrolled in any outpatient program also used this service more than those without it (p=.02).

Lemming and Calsyn (2004) indicated that individuals with SMI who had professional support services, used more total (medical and psychiatric) services (Lemming & Calsyn, 2004). But considering enrollment in any outpatient program was consistent between AAs and Whites in this study, this finding could indicate that outpatient service providers might act as gatekeepers to residential treatment and were less likely to refer AAs clients to residential care. Xie and colleagues (2004) finding that ACT patients were more likely than those with standard case management to be hospitalized supports the conclusion that advocacy by mental health professionals plays a role in service access (Xie et al., 2004).

An alternative explanation is that the higher use of residential services by Whites compared with AAs could be the result of the referral process to follow-up care within the RCPs. The median time to readmission for both AAs and Whites was one day, indicating that subjects moved directly from one residential program to another (i.e. crisis residential to transitional residential). It is possible that the difference in referral occurred at this point in care, rather than in the admission to crisis residential services. Future research might include differentiating types of residential care by level of acuity.

In the logistic regression model, both the full and backward stepwise models revealed that only enrollment in any outpatient program was a predictor of residential service use (OR=3.79, p=.02). Race exited the model at the previous step (p=.06).

The reduced Poisson regression model excluding non-service users had ratio of lifetime drug use (p=.02) as a predictor, whereas the model including non-service users had only enrollment in any outpatient program as a predictor (p=.005). Race (p=.09) and ratio of lifetime drug use (p=.10) neared significance at the .10 level. Again, in examining the influences on residential service use, the influence of vulnerable, predisposing, and enabling characteristics, outweighed measures of need.

In summary, though at baseline, AAs were exposed to more vulnerable influences such as homelessness and victimization, when controlling for other variables, racial differences were either not evident or not sustained with regard to mental health service utilization, crisis, inpatient, or residential. Although Hackman and colleagues (2006) reported that drug and alcohol use were unrelated to medical emergency service use (Hackman et al., 2006), this study reveals that there is a relationship between substance use, particularly drug use, and psychiatric emergency or crisis service use. Enabling resources, such as financial benefits and the advocacy of a mental health service provider appear to be required to access services in this sample, regardless of need. Lemming and

Calsyn (2004), also found that enabling resources, particularly professional support, were more influential than need or predisposing characteristics in predicting service use.

There were a total of 92 subjects that used crisis services, 53 that used inpatient services, and 102 that used residential services out of the 155 subjects. Considering that need has the least influence (other than possibly substance-induced need), it appears that the more acute services, i.e. crisis and inpatient care, are equally accessible to Whites and AAs. Rationing services, particularly inpatient, in efforts to cut costs might have served to minimize apparent disparities, by restricting care for all rather than increasing access for AAs. Reliance on these services appears to have shifted to higher use of residential services in lieu of inpatient services.

It is important to consider the meaning of low numbers of inpatient admissions and shorter lengths of stay. These phenomena do not appear to indicate that functional status has improved among patients or that the mental health care system is delivering community services more effectively. It appears that in this study, care has shifted to a less costly alternative in residential treatment. The mean number of days spent in residential care overall was 75.79±86.17 or roughly 2.5 months out of the year. The number of days spent in residential care ranged from 0-365 days, even when the four long-term care recipients were excluded. Though this service might be less costly financially, there could be non-monetary costs for patients, particularly those who have medical comorbidities, as the direct care staff in RCPs lack medical and/or minimal psychiatric training (DeCoux, 2005).

Dixon and colleagues (1999) reported that 65% of individuals with SMI experience at least one lifetime medical condition and that rates for diabetes exceed those of the general population. And although the rates of hypertension and heart disease reported were similar to the general population, the SMI were afflicted with these conditions at younger ages (Dixon, et al., 1999). This data supports the mortality statistics cited earlier regarding SMI individuals likelihood to die one to ten years earlier than the general population most commonly from heart disease, cancer, and other conditions (Colton & Manderscheid, 2006). Though the clients in the RCPs have access to nurse practitioners, their oversight is limited to certain practice hours as would be the case with any primary care provider with the expectation that care instructions would be carried out by the clients themselves or with the assistance of care providers. The direct care staff in RCPs are left to supervise the complex care needs of these individuals with little preparation to adequately manage the responsibility.

Disparities do appear to exist in the use of residential services in this population. Discrimination, conscious or subconscious, could exert an influence as well if referral practices differ for mental health care providers in outpatient programs who serve AA and White consumers differentially.

Strengths

There are a number of strengths of this study. This is a secondary analysis of a longitudinal randomized controlled trial, so service utilization outcomes were obtained over a 12-month period. The study utilized a prospective design using a theoretical framework to guide the analysis. Subjects were recruited at the same level of care and therefore a homogeneous sample of community dwelling adults with SMI was obtained.

Service utilization data were obtained from MHSU records that are considered to be highly reliable. Other studies have used MHSU records from large information systems (Snowden and Thomas, 2000). Also, other measures of predictor variables were obtained from the use of standardized measures with established reliability and validity. The limitations of this study are listed below along with attempts made to address these issues.

Limitations

Sample

There were 16% of the original sample (parent study) who self-identified their race as other or biracial. It was not determined if these subjects would be considered socially as either AA or White. Since race is a social phenomenon, it would be beneficial to determine the experience of those who appear, but may not identify with one race or the other. All subjects who self-identified race as other were excluded from this sample.

Furthermore, subjects were recruited from residential treatment programs. First, there may be inherent differences in persons who agree to participate in a randomized controlled trial and those who do not. The sample might also not be representative of stable outpatients as subjects were recruited at a relatively acute stage of illness. This might make detecting racial differences more difficult.

Some of the data utilized as predictor variables comes from self-report data, which might present a limitation. A number of studies have established the reliability of self-report for persons with SMI. A study of 43 individuals with SMI established a high degree of concordance between self-report and clinical records for recent life events, alcohol use, and treatment in the previous year. There was discordance noted for illegal activities including drug use and time spent in jail (Chafetz, et al 1997). Goldberg and associates (2002) also established that the SMI can provide reliable self-report on service use, particularly regarding the period six months prior to data collection. The subjects were asked to answer interview questions based on the previous six months or less. Lehman and colleagues (1999) also found that patient self-report of inpatient service days was highly correlated with ACT team data (r=.86), but not Medicaid claims (r=.18) (Lehman et al., 1999). This could indicate that MHSU records might under-represent actual use of services and that both self-report and objective data should be collected when possible to measure service use.

Measures

The GAF score was used as a global measure of symptomatology and general functioning, but it does not measure specific symptoms. This type of measurement might have been informative as Prince and colleagues (2007), in a study of 307 individuals with schizophrenia spectrum disorders found that psychosis, above and beyond symptoms of anxiety, depression, or paranoia, was more likely to result in an inpatient admission.

Another issue to consider with the baseline GAF score is that it reflects function at the time of admission to a residential crisis program. Subjects GAF scores were naturally low at that time. It is possible that using GAF scores recorded at follow-up interviews might have provided a more accurate measure of functioning, however, since not all subjects completed follow-up interviews, their use would have resulted in a reduced sample size.

Although there were self-reports of medical service use available from the interviews, there was no access to a database similar to that used for MHSU records for medical services. This was unfortunate considering that medical emergency use has also been associated with reported mental health problems and substance abuse crisis service use (Lundgren et al., 2005; Rothbard et al., 2004).

Finally, the extent of outpatient service use was not measured in this study. MHSU data listed the service open date, close date, and last service use date only, so the frequency of outpatient service use was unavailable. In Folsom and colleagues (2005), it was found that homeless individuals used less outpatient services and more crisis residential, inpatient, and psychiatric emergency services. Quantifying actual use of outpatient services could provide more meaningful interpretation of results, since subjects that had the service open and available, might not have had the means or propensity to use it.

Unlike several studies that have found that intensive case management or standard case management programs have reduced the costs of psychiatric emergency and inpatient service use (Lehman et al., 1999), subjects in this study who were enrolled in outpatient service programs used more services than those who were not enrolled. This indicates that the case manager or mental health care provider's role is critical to facilitate access to needed mental health care services.

Xie and colleagues (2004) study of 204 mentally ill patients in the community, found that the group using ACT was admitted to the hospital more than those not in ACT programs. In the context of services for San Francisco, services delivering more intensive forms of case management generally target high-risk groups such as long term care, forensic, and homeless service users. If one were to compare a group of high service users to a control group whose use is not as high, it might appear erroneously that the intervention is ineffective. Intensive case management services that serve clients with significant mental health care needs, most likely are best at advocating for the service needs of their clients.

Intensive case management services were used by only 15% of the subjects, similar to Evans and colleagues (2004) whose subjects reported difficulty in accessing services they needed. The lack of access to intensive case management (ICM) services might also be related to geographic location. Kuno & Rothbard (2005) found that ICM was less available in low-income areas with high AA populations (29%) than in high-income areas with low AA populations (67%). This study took place in an urban community amongst low income individuals from various ethnicities and the limited availability of ICM might be explained in this way.

Analysis

The small sample size, especially in analyses that excluded non-service users also presented challenges regarding power and validity of results. As a result, analyses were conducted using a variety of methods to support the validity of the findings and to reduce the number of variables in the model by using backward stepwise techniques and establishing criteria for inclusion in the final model.

Implications for Nursing and Directions for Future Research

Nurses and mental health care providers must be aware of the significant barriers to access that exist for individuals with SMI, particularly AAs and recognize the opportunity for and responsibility to advocate for appropriate service provision to those in need. This study examined the influence of race and other factors on mental health service utilization. Some important influences were not completely captured in this study that should be included in future research.

The statistical lack of association between race and mental health service utilization outcomes might be the result of Type II error. The possibility remains that a difference actually exists, but that was not detected in this analysis. There were some racial differences (i.e. time spent in jail) that were significant in the parent study (N=309) that were not found in this secondary analysis (N=155). This could be the result of low sample size and subsequently, insufficient power. It might be necessary to oversample AAs and Whites with SMI in future studies to be able to detect differences related to dual disparities.

The alternative conclusion is that this lack of association is a valid result. Though the studies that were based in outpatient settings were limited, the findings were frequently null with regard to racial differences in diagnosis, medication doses, and service use, to name a few. As hypothesized in Chapter 2, it is possible that once moderately stable in the community, racial disparities are diminished.

Another important consideration regarding the results of this study is that despite there not being a relationship between race and MHSU outcomes when controlling for other variables, there were some baseline differences nonetheless. AAs were more likely to be homeless, victims of violence, and though the use of residential services might have served to meet some of their needs, they were also less likely than Whites to access this service. Although disparities among AAs and Whites with SMI in this sample might have been more readily attributable to conditions other than race, if AA race predisposes one to those disadvantaged conditions, the disparity should be viewed as no less significant.

The literature implies that AAs use of outpatient mental health services is lacking. This predisposition could contribute to poorer economic and living conditions. Future research should include efforts to increase this population's participation in outpatient mental health services and has the potential to improve quality of life in a variety of ways. One way this might be accomplished is by developing interventions that faciliatate collaborative patient-provider relationships.

Other considerations for future research include recruitment of subjects from a variety of service settings including inpatient and outpatient settings to represent mental health consumers that use both types of services. Quantifying the amount and frequency of outpatient service use can also provide a measure that reflects actual benefits drawn from the use of the service compared with knowing only that a service was open and available. Including measures of specific psychopathology will give more information about need factors involved in service utilization as well.

In conclusion, though this study showed minimal influence of race on mental health service utilization outcomes, it indicates that access to care is limited and accessible to individuals when they are severely symptomatic and who have insurance to cover the costs of care, regardless of race. Vulnerabilities such as homelessness and violence are more common in AAs and increase their risk for poor health outcomes. Improvements in care delivery and access must be prioritized to include outreach to engage individuals in care that are not in crisis to improve their functioning, quality of life, and to promote progress toward recovery.

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APPENDIX

Table 2.1. Summary of the Literature: Disparities in Mental Health Care Among AAs with SMI

Investigator Race Discussed Y/N	Year	N	%AA %W	Diagnosis	Inpatient (I) or Outpatient (O)	Study Design	Significant Outcomes	Additional Considerations
Arnold, Keck, et al. N	2004	193	47% 53%	Schizophrenia, SAD, MD, BAD, other	I	Cross-sectional	*AAs more likely to be identified as having more severe psychotic symptoms	
Bae, Brekke, & Bola N	2004	226	36% 48%	Schizophrenia	O	Longitudinal	*No racial differences in symptoms *Similar but slower response to treatment for AAs	
Baker et al., 1999	1999	46	100% 0%	Schizophrenia Mood disorder Substance abuse	O	Quasi-experimental	*Psychosocial rehab effective for dually diagnosed AAs with SMI	
Barrio, Yamada, et al N	2003	351	25% 57%	Schizophrenia	O	Longitudinal	*Races similar in acuity and symptoms *AAs more suspiciousness and halluc.	
Barrio et al. N	2003	4,249	5% 60%	Schizophrenia SAD	O	Retrospective	*Whites used case management services 2 times more than AAs	

Investigator Race Discussed Y/N	Year	N	%AA %W	Diagnosis	Inpatient (I) or Outpatient (O)	Study Design	Significant Outcomes	Additional Considerations
Barnes N	2004	2,311	20% 79%	Schizophrenia, Mood disorder	I	Retrospective	*AAs almost 5 times as likely to be diagnosed with schizophrenia *Increase in rate of schizophrenia diagnosis in AAs after DSM-IV published	
Bolden & Wicks N	2005	4,474,732	13% 74%	Psychosis, ETOH/drug abuse, depressive neurosis	I	Cross-sectional descriptive	*AAs had longest length of stay in hospital 5.5d vs. 4.9 d for Ws *males LOS longer than females6.3 vs. 5.2 *58.5% of AAs used ED, primary type of admission for AAs *most prevalent dx for AAs psychosis followed by drug/etoh dependence *longer LOS believed to be indicative of more severe illness due to tx delay	

Investigator Race Discussed Y/N	Year	N	%AA %W	Diagnosis	Inpatient (I) or Outpatient (O)	Study Design	Significant Outcomes	Additional Considerations
Borowsky, Rubenstein, et al. N	2000	661	16% 74%	MD, dysthymia	O	Cross-sectional	*AA less likely than whites to have depression detected *Better detection if severe symptoms or comorbid medical condition	
Brekke & Barrio N	1997	184	33% 52%	Schizophrenia	O	Longitudinal	*W more symptomatic than AA and Latinos *AA and L more benign symptoms of schizophrenia	AA and Latinos combined
Brown, Schulberg, & Madonia N	1996	272	44% 56%	MD	O	RCT	*AAs had more physical symptoms as opposed to mood symptoms recorded *AAs had more psychosocial stresses	Individuals with substance abuse conditions were excluded as well as severe or psychotic depression
Brown, Schulberg, et al. N	1999	160	43% 57%	MD	O	RCT	*AA and Ws had similar self-reported symptoms but AAs were seen as more severe by providers	
Butterfield, Bosworth, et al. N	2004	376	59% 41%	Schizophrenia, SAD, BAD, other	I	Cross-sectional	*AAs more likely to be diagnosed with schizophrenia as well as to be younger and institutionalized or homeless	Veteran's Administration study

Investigator Race Discussed Y/N	Year	N	%AA %W	Diagnosis	Inpatient (I) or Outpatient (O)	Study Design	Significant Outcomes	Additional Considerations
Chen, Swann, & Bankole N	1998	936	52% 36%	Schizophrenia, BAD, Substance abuse disorder	I	Longitudinal	*AAs more likely to have diagnosis changed from BAD to schizophrenia than Ws	
Chen, Swann, & Burt N	1996	443	55% 34%	Schizophrenia, BAD, MD, substance abuse, other	I	Retrospective	*AAs have a higher rate of diagnostic change to schizophrenia *AAs more likely to keep an initial diagnosis of schizophrenia	
Chow, Jaffee, & Snowden N	2003	78,085	25% 58%	SAD, nonpsychotic d/os & OBS	O, I	Survey	*Overdiagnosis of schizophrenia only in low poverty areas	Mixture of service types and types of conditions not restricted to SMI
Chung et al. N	1995	164	46% 54%	Psychotic and mood disorders	I	Retrospective	*Ws more likely high socioeconomic status than AAs *AA with schizophrenia higher daily doses of neuroleptics than Ws with schizophrenia	

Investigator Race Discussed Y/N	Year	N	%AA %W	Diagnosis	Inpatient (I) or Outpatient (O)	Study Design	Significant Outcomes	Additional Considerations
Compton et al. N	2004	10	100% 0%	Schizophrenia spectrum	n/a	Qualitative, exploratory	*For AA family members, social disturbance or unbearable symptoms prompted first treatment *Family members fear racial discrimination when seeking care	
W. M. Compton, 3rd et al., 2000 N	2000	512	61% 35%	Any psychiatric or substance abuse disorder	I ,O	Survey	*AAs higher rates of cocaine and amphetamine use and lower for all other substances	Only 1% of sample diagnosed with SMI
Cooper-Patrick et al. N	1999	1,816	45% 43%	No psychiatric diagnosis	O	Survey	*Physician-patient relationship more participatory if patient is white, older, graduate school educated, and if physician is female	Non-SMI population
Copeland et al. N	2003	69,787	30.1% 61.3%	Schizophrenia	O	Retrospective	*AAs more likely than Ws to have comorbid substance use disorder *AAs less likely than Ws to have atypical antipsychotic prescribed	

Investigator Race Discussed Y/N	Year	N	%AA %W	Diagnosis	Inpatient (I) or Outpatient (O)	Study Design	Significant Outcomes	Additional Considerations
Covell et al. N	2002	400	44% 37%	Schizophrenia spectrum	O	Longitudinal	Whites 1.75 times more likely to be prescribed atypical antipsychotic and ½ as likely to be prescribed depot	
Delahanty, Ram, et al. N	2001	123	73% 27%	Schizophrenia with depression	I	Survey	*Ws 8 times more likely than AAs to have depression detected	
Diala, Muntaner, et al N	2001	8,098		MD, any disorder	O	Survey	*Rates of MD similar between races	Relative race percentages not mentioned in study nor the diagnostic percentages
Diaz & De Leon N	2002	763	41% 59%	Schizophrenia and others	I	Retrospective	*AAs with schizophrenia 1.8 times higher odds of having excessive dose of antipsychotic than whites	Atypicals not in use at time of study
Dixon, Green-Paden, et al. N	2001	685	44% 56%	Schizophrenia with mood or anxiety disorder	I and O	Survey	*Ws more likely to have had previous or current treatment for depression or mood disorder	

Investigator Race Discussed Y/N	Year	N	%AA %W	Diagnosis	Inpatient (I) or Outpatient (O)	Study Design	Significant Outcomes	Additional Considerations
dosReis et al. N	2002	6,067	61% 28%	Schizophrenia	O	Cross-sectional	*AAs higher daily doses of high potency antipsychotics than Ws *48% of patients with schizophrenia who did not receive treatment were young, AA males	
Dunlop, Song, et al N	2003	7,690	16% 75%	MD	O	Survey	*AA more likely to have characteristics associated with MD but less likely to get the diagnosis	Age range of subjects is 54-65
Fabrega, Mezzich, & Ulrich Y-observed	1988	6673	21% 79%	SAD, anxiety, dementia	O	Cross-sectional	*Similar presentation of depressive symptoms between racial groups *No tendency for AAs to be more paranoid than Ws	Sample was 59% women, very uncharacteristic for a typical SMI population study
Farmer & Pandurangi N	1997	42	21% 79%	Schizophrenia	O	Cross-sectional	*AAs have higher stress and lower quality of life, disparities in age of first service use	Low overall N and only 9 AA subjects

Investigator Race Discussed Y/N	Year	N	%AA %W	Diagnosis	Inpatient (I) or Outpatient (O)	Study Design	Significant Outcomes	Additional Considerations
Fisher et al. N	2000	192	17% 71%	Psychotic, mood, personality, anxiety, or substance use disorders	Criminal Justice	Cross-sectional	*Use of case management services associated with having insurance *SMI and criminal justice involvement associated with being male, non-white, history of substance abuse, and number of previous hospitalizations	
Fleck, Keck, et al	2005	50	40% 60%	BAD	O	Cross-sectional	*poor insight in both AAs and whites; also physical and cognitive s/es as major reasons for full or partial nonadherence *AAs significantly more likely also endorsed ideas that meds are perceived by others as a symbol of MI and fear of becoming addicted *over 50% poor adherence	

Investigator Race Discussed Y/N	Year	N	%AA %W	Diagnosis	Inpatient (I) or Outpatient (O)	Study Design	Significant Outcomes	Additional Considerations
Fleck et al. N	2002	58	41% 59%	BAD	I to O	Longitudinal	*AAs more likely to use conventional antipsychotics and to use for longer periods of time than Ws	

Investigator Race Discussed Y/N	Year	N	%AA %W	Diagnosis	Inpatient (I) or Outpatient (O)	Study Design	Significant Outcomes	Additional Considerations
Folsom, Hawthorne, Lindamer, et al. N	2005	10,340	11% 62%	Schizophrenia, BAD, MD, Substance Abuse d/o	O	Cross-sectional	*homeless more likely to be male, younger, and AA; *substance abuse (x4) more common in homeless and fewer had medi-cal insurance (2x) *homeless lower GAF scores *homeless more likely to use crisis residential treatment x 10 and 4 x's more likely to use inpatient psychiatric services and PES *15% of SMI in public mental health system were homeless *schizophrenia (x2.4) and BAD (x1.6) higher rates of homelessness than MD *homeless less likely to receive outpatient services	

Investigator Race Discussed Y/N	Year	N	%AA %W	Diagnosis	Inpatient (I) or Outpatient (O)	Study Design	Significant Outcomes	Additional Considerations
Ford N	2002	55	100%	SMI	O	Exploratory	*High levels of PTSD and exacerbation of symptoms in existing disorders due to exposure to violence	Low N and this sample included only women
Giles, Perlis, et al Y-self identified	1998	93	33% 67%	MD	I and O	Cross-sectional	*No difference in severity of depressive symptoms or history of depression *Clinicians rated AAs to be less depressed	Substance abuse excluded.
Herbeck et al N	2004	700	18% 82%	Schizophrenia, MD, BAD, Dementia, substance use	O	Survey	*AA males less likely to receive atypicals, AA females equal to Ws	
Hines-Martin, Usui, et al N	2004	739	18% 82%	None	n/a	Cross-sectional	*men were less favorable than women to mental health svs *married, better education, familiarity with counseling svs more positive toward mental health svc use *race non significant, but Ws were significantly more likely to be familiar with counseling svs	

Investigator Race Discussed Y/N	Year	N	%AA %W	Diagnosis	Inpatient (I) or Outpatient (O)	Study Design	Significant Outcomes	Additional Considerations
Jeste, Lindamer, et al. N	1996	66	50% 50%	Schizophrenia	O	Cross-sectional	*No difference in psychopathology between groups	Low N
Jonas, Brody, et al. N	2003	7,667		Any mood disorder	O	Cross-sectional	*Ws exceed AAs in MD diagnosis but AAs exceed Ws in dysthymia diagnosis	Diagnoses made by lay interviewers and does not state percentages of racial groups (though reports oversampling AAs)
Kessler & Neighbors N	1986			No psychiatric diagnoses		Meta-analysis	*Low income AAs have more psychological distress than low income Ws	General population sample
Kilbourne, Haas, et al. N	2004	813	15% 85%	BAD	I and O	Cross-sectional	*Older AAs with BAD were more likely than Ws or younger AAs to have a previous diagnosis of schizophrenia	Veteran’s administration sample

Investigator Race Discussed Y/N	Year	N	%AA %W	Diagnosis	Inpatient (I) or Outpatient (O)	Study Design	Significant Outcomes	Additional Considerations
Kuno & Rothbard	2005	1995		Schizophrenia	O		*receipt of ICM 29% in LI/HA area to 67% in HI/LA *LI/HA area pts received less intensive svs, i.e. med mgmt and outpatient services; intensive svs provided to less than half *LI/HA also shorter duration of outpatient tx 8.2 vs. 9.7 months *# of hosp days less for LI/HA areas 30.7 vs. mean of 41.4 days	All had insurance coverage and similar levels of disability
Kuno & Rothbard N	2002	2,515	61% 39%	Schizophrenia	I and O	Cross-sectional	*AA receive depot medications more than Ws AAs use more emergency services than Ws *Ws use more outpatient services than AAs	
Kreyenbuhl, Zito, et al. N	2003	334	39% 61%	Schizophrenia or SAD	I and O	Survey	*AAs and Ws equal in psychiatric symptoms but not treatment	Mixture of inpatient and outpatient sample

Investigator Race Discussed Y/N	Year	N	%AA %W	Diagnosis	Inpatient (I) or Outpatient (O)	Study Design	Significant Outcomes	Additional Considerations
Lambert et al. N	1996	452	33% 64%	Schizophrenia, BAD, MD, PTSD, substance abuse	I	Cross-sectional	*Polydrug use and psychiatric comorbidity more common in AAs than Ws *Non-substance using group more likely to be female and over age 65	
Lehman et al. N	1999	152	72% unknown	Schizophrenia spectrum, mood disorders, other	O	Clinical Trial	*Ws more likely to be stably housed than AAs in assertive community treatment *Non-assertive community treatment AA patients more likely to use inpatient and PES svs	

Investigator Race Discussed Y/N	Year	N	%AA %W	Diagnosis	Inpatient (I) or Outpatient (O)	Study Design	Significant Outcomes	Additional Considerations
Lemming & Calsyn	2004	3855	51% 49%o other	Schizophrenia, MD, BAD, personality d/o, drug/ETOH, other	O	Prospective	*enabling variables (esp. professional support) explained more than predisposing or need *AAs received fewer svs at baseline but not at 12 months *participants with more education received more total svs at both time periods *pts with substance abuse problems used less total svs both time periods *pts with professional support svs received more total svs *less stable housing, more total svs used at 12 months, *poorer physical health, more total svs *pts using substances had fewer CM visits and fewer other svs *Site was a predictor of svs utilization, decreased over time	Homeless population Total svs = adding medical psychiatric, substance abuse, housing, and other svs (outpatient or inpatient) Svs use was self reported Uses ABM

Investigator Race Discussed Y/N	Year	N	%AA %W	Diagnosis	Inpatient (I) or Outpatient (O)	Study Design	Significant Outcomes	Additional Considerations
Linhorst, Hunsucker, & Parker N	1998	842	38% 62%	Schizophrenia, substance abuse, other	Criminal justice	Cross-sectional	*In criminal justice system AAs more likely to be diagnosed with schizophrenia	Sample of insanity acquittees
Mark et al. N	2002	752	43% unknown	Schizophrenia spectrum	I and O	Survey	*AAs received atypical antipsychotics less than Ws *Patients treated with atypicals had lower scores on side effect scales	
Mark, Palmer, et al. Y-self identified and definition	2003	2,239	38% 62%	Schizophrenia, SAD	I and O	Prospective	*Blacks were more likely to be diagnosed with schizophrenia than Ws	Racial groups were black and non-black. Blacks included AA, Afro Caribbean, and black Hispanics
Matthews, Glidden, & Hargreaves N	2002	4,131	28% 56%	BAD, SAD, schizophrenia, MD, other	I	Retrospective	*AAs more likely to be diagnosed with schizophrenia or SAD even on cultural focus unit *AAs less likely to be diagnosed with MD	

Investigator Race Discussed Y/N	Year	N	%AA %W	Diagnosis	Inpatient (I) or Outpatient (O)	Study Design	Significant Outcomes	Additional Considerations
McAlpine & Mechanic N	2000	9,585		Schizophrenia spectrum, BAD, and other	O	Survey	*SMI associated with being AA, substance use, worse physical health, lower socioeconomic status, more inpatient and emergency use *3/5 SMI received no specialty mental health care in the previous year	
Miranda, Chung, et al. Y-self identified	2003	267	44% 16%	MD	O	RCT	*With assistance with removing obstacles to receiving care, there was no difference in likelihood of receiving, continuing with, or outcomes of treatment between races	Sample was all women
Mojtabai et al. N	2003	189	Unknown 71%	Schizophrenia	I	Longitudinal	*Use of atypicals associated with less medication changes, less rehospitalization	

Investigator Race Discussed Y/N	Year	N	%AA %W	Diagnosis	Inpatient (I) or Outpatient (O)	Study Design	Significant Outcomes	Additional Considerations
Montross, Yamada, et al	2005	6424	19% 60%	Schizophrenia	O	Cross-sectional	*rates of comorbid substance abuse d/o highest among AAs 25%, Ws 22% *comorbid substance abuse d/o predicted by AA ethnicity, male gender, and homelessness	homeless
Neighbors, Trierweiler, et al. Y-self identified	2003	665	81% 19%	Schizophrenia spectrum, mood disorder	I	Cross-sectional	*AA more likely to receive diagnosis of schizophrenia and Ws more likely to get a diagnosis of BAD *Similar depression rates between races	Use of structured interview and both AA and W interviewers
Neighbors, Trierweiler, et al. Y-self identified	1999	665	81% 19%	Schizophrenia spectrum, mood disorder	I	Cross-sectional	*Semi-structured interview can reduce but not eliminate the impact of race on diagnosis	
Opolka et al. N	2003	2601		BAD, Substance abuse disorder		Cross-sectional	*AAs receive atypicals less than whites *Prescriptive practices vary by treatment setting	

Investigator Race Discussed Y/N	Year	N	%AA %W	Diagnosis	Inpatient (I) or Outpatient (O)	Study Design	Significant Outcomes	Additional Considerations
Opolka et al. N	2004	2,857	49% 57%	Schizophrenia spectrum		Cross-sectional	*Atypicals more likely if female, previously prescribed clozapine or depot medication, and prescribed several antipsychotics	
Oquenedo, Ellis, et al. Y-discusses ethnic subgroups	2001	14,699	25% 67%	MD	O	Survey	*Similar rates of depression between AA and Ws	Sample included subjects over the age of 65
Pollack et al. N	2000	122	34% 66%	BAD	I	Cross-sectional	*Coping resources are perceived higher by AAs than Ws	
Regier et al. N	1990	20,291		Any mental disorder, schizophrenia and affective disorders included	I and O	Cross-sectional	*47% of subjects diagnosed with schizophrenia had a substance abuse d/o	
Rollman, Hanusa, et al. Y-self identified	2002	204	25% 75%	MD	O	Prospective	*AA screened positive for depressive symptoms but did not meet DSM-IV criteria for MD *Of depressed, symptoms were similar in type and severity between racial groups	

Investigator Race Discussed Y/N	Year	N	%AA %W	Diagnosis	Inpatient (I) or Outpatient (O)	Study Design	Significant Outcomes	Additional Considerations
Rosenheck et al. N	2000	423	29% 66%	Schizophrenia	I	Clinical Trial	*Subjects taking clozapine participated longer in clinical trial *AAs withdrew from trial due to weight gain and other side effects	
Ruiz et al. N	1999	204	66% 28%	Schizophrenia	I	Cross—sectional	*AA and Ws antipsychotic doses similar when weight controlled	
Salyers & Bond N	2001				O	Cross-sectional	*White CMs report more emotional exhaustion and depersonalization if caseload is racially incongruent	CMs were subjects
Scheller-Gilkey et al. N	2003	122	82% 18%	Schizophrenia	O	Cross-sectional	*AAs with history of substance abuse more likely to be prescribed conventionals *Subjects with a history of substance abuse reported more symptoms of depression and anxiety	

Investigator Race Discussed Y/N	Year	N	%AA %W	Diagnosis	Inpatient (I) or Outpatient (O)	Study Design	Significant Outcomes	Additional Considerations
Segal et al. N	1995	310	64% 17%	SAD, panic d/o, PTSD, substance abuse	Self-help	Survey	*Users of self-help services: 46% homeless, 87% psychiatric disorders, 50% substance use problems, 25% with 8 or more health problems	
Snowden et al. N	1995	Unknown	10% 66%	Schizophrenia (35%), Adjustment reaction (19%)	O	Prospective	Ethnically matched subjects to CMs had less emergency service use	
Snowden & Thomas N	2000	13, 791		Unknown	O	Survey	*AAs use less outpatient mental health services than Ws *Uninsured AAs more likely in poverty than uninsured Ws	
Spitz et al. N	1997	195	36% 53%	Schizophrenia	I	Cross-sectional	*AAs have higher levels of creatine kinase, attributed to higher psychological stress	

Investigator Race Discussed Y/N	Year	N	%AA %W	Diagnosis	Inpatient (I) or Outpatient (O)	Study Design	Significant Outcomes	Additional Considerations
Strakowski, Flaum, et al. N	1996	330	26% 74%	Schizophrenia, other psychotic disorders	I	Cross-sectional	*AAs more likely to receive diagnosis of schizophrenia and less likely a diagnosis of psychotic depression though rates of affective symptoms similar between racial groups	Discusses the role of first rank symptoms in the diagnostic decision making process
Strakowski, McElroy, et al. N	1996	100	41% 58%	BAD, SAD, MD, schizophrenia, other	I	Cross-sectional	*AAs with psychotic mania less likely than Ws to receive a diagnosis of BAD or SAD though no difference in symptom profiles between races	
Strakowski, Hawkins, et al. N	1997	99	56% 37%	Schizophrenia spectrum, MD, other	I	Cross-sectional	*AAs had greater diagnostic disagreement from PES interview to structured interview than Ws due to inadequate information obtained by clinician	Psychiatric emergency service contact for first episode psychosis

Investigator Race Discussed Y/N	Year	N	%AA %W	Diagnosis	Inpatient (I) or Outpatient (O)	Study Design	Significant Outcomes	Additional Considerations
Strakowski, Keck, et al. Y-definition	2003	79	49% 51%	Schizophrenia spectrum	I	Cross-sectional	*AAs more likely to be identified as having first rank symptoms by face to face clinicians but no difference found between racial groups by expert consensus blinded to race	Symptoms evaluated by professionals blinded and unblinded to race
Sullivan & Spritzer N	1997	210	79% 21%	Schizophrenia	I and O	Cross-sectional	*Ws more likely to use community mental health services than AAs *AAs more likely than Ws to report satisfaction with state hospital services	
Theriot et al. N	2003	248	69% 31%	Major mental disorder, substance abuse disorder	Self-help	Cross-sectional	*Highest users of self-help services are homeless and AAs	

Investigator Race Discussed Y/N	Year	N	%AA %W	Diagnosis	Inpatient (I) or Outpatient (O)	Study Design	Significant Outcomes	Additional Considerations
Trierweiler, et al. N	2006	292	72% 28%	Schizophrenia and major affective disorders	I	Cross-sectional	*AA clinicians diagnosed schizophrenia when hallucinations were present, but less so when substance abuse was present *non-AA clinicians diagnosed schizophrenia related to negative symptoms	Racial categories AA and non-AA
Trierweiler, et. al. N	2005	234	72% 28%	Schizophrenia and major affective disorders	I	Cross-sectional	*AA and non-AA clinicians weighted situational attributions differently, but only non-AA clinicians were more likely to diagnose a mood d/o rather than schizophrenia when considering this information	Racial categories AA and non-AA

Investigator Race Discussed Y/N	Year	N	%AA %W	Diagnosis	Inpatient (I) or Outpatient (O)	Study Design	Significant Outcomes	Additional Considerations
Trierweiler, Neighbors, et al. N	2000	292	72% 28%	Schizophrenia, major affective disorders	I	Cross-sectional	*AAs more likely to receive diagnosis of schizophrenia *AAs more likely to have clinicians attribute symptoms such as paranoia, suspiciousness, and hallucinations, and negative symptoms *Mood symptoms attributed less in AAs	Racial groups were AA and non AA
Valenstein et al. N	2004	49,003	29% 61%	Schizophrenia spectrum	I and O	Cross-sectional	*Similar adherence between clozapine and conventional antipsychotics *Non-adherence associated with AA ethnicity and younger age	
Valenstein et al. N	2001a	936	16% 81%	Schizophrenia	I	Cross-sectional	*Young, AAs more likely than Ws to receive high doses of antipsychotics *Unknown why clinicians deviate from recommended dosages	

Investigator Race Discussed Y/N	Year	N	%AA %W	Diagnosis	Inpatient (I) or Outpatient (O)	Study Design	Significant Outcomes	Additional Considerations
Valenstein et al. N	2001b	1,637	16% 81%	Schizophrenia	I	Cross-sectional	*AAs considered to be less adherent than Ws *Excessive doses in AAs related to excessive depot doses	
Valenti et al. N	2003	276	50% 50%	Schizophrenia spectrum	I	Retrospective	*Conventional antipsychotic prescriptions associated with AA ethnicity, substance abuse disorder, and schizophrenia diagnosis *Conventional 2 times more likely to be prescribed depot	
Walkup et al. N	2000	293	59% 40%	Schizophrenia spectrum	I	Survey	*Excessive antipsychotic doses in AAs associated with use of depot medications	
Whaley N	2004a	180	34% 66%	Well and mentally ill		Secondary analysis	*AAs more likely than W men to be hospitalized *Mild paranoia may hinder help seeking behavior in AA men	76% of sample well

Investigator Race Discussed Y/N	Year	N	%AA %W	Diagnosis	Inpatient (I) or Outpatient (O)	Study Design	Significant Outcomes	Additional Considerations
Whaley Y-self-identified	2004b	116	100% 0%	Schizophrenia and non-schizophrenia	I	Cross-sectional	*AA men with SMI who perceive the environment as threatening are more likely to abuse substances	
Whaley N	2002	156	100%	Schizophrenia, SAD, affective disorders	I	Retrospective	*Schizophrenia diagnosis predicted by depressed mood, paranoid thought and pressured speech *Negative symptoms and social dysfunction common between diagnostic groups *Depressed mood increased the likelihood of an affective diagnosis	Excluded symptoms of hallucinations and delusions
Whaley N	1998	565		Depression, schizophrenia, and non-ill	O	Cross-sectional	*Mild paranoia or cultural mistrust exists in AAs even without mental disorders and should not be construed as psychopathology	Percentage in racial groups not reported

Investigator Race Discussed Y/N	Year	N	%AA %W	Diagnosis	Inpatient (I) or Outpatient (O)	Study Design	Significant Outcomes	Additional Considerations
White, Chafetz, et al.	2006	308	24% 43%	Depression, non-affective psychoses	O	Longitudinal	*AA race significantly assoc w/ length of incarceration *substance abuse associated with time in jail or prison *subjects who were homeless past 6 months 2x's as likely to have been victimized *being female and homeless associated with reporting victimization *nearly ¾ had been arrested	
Zhang & Snowden N	1999	18,152	19% 70%	Schizophrenia spectrum, MD, BAD, other	O	Cross-sectional	*AAs and Ws equally diagnosed with schizophrenia and BAD *AAs diagnosed with dysthymia and substance abuse disorder less than Ws	

Investigator Race Discussed Y/N	Year	N	%AA %W	Diagnosis	Inpatient (I) or Outpatient (O)	Study Design	Significant Outcomes	Additional Considerations
Zigler & Glick n/a	1988	n/a		Paranoid schizophrenia		Review	*Paranoia may be more similar to a mood symptom than psychotic i.e. seen as a coping mechanism for depression and has similarities to mania	

Abbreviations:

BAD: bipolar affective disorder
CM: case manager
D/O: disorder
ED: emergency department
ETOH: alcohol
ICM: intensive case management
LI/HA: low income, high African American
MD: major depressive disorder
MI/SMI: severe mental illness
PTSD: post traumatic stress disorder
PTS: patients
RCT: randomized controlled trial
SAD: schizoaffective disorder
S/Es: side effects
SVS: services
Tx: treatment

Table 2.2. Studies Using the Andersen Behavioral Model

Authors/Year	Population	Predisposing	Enabling	Need	HSU/other
Afilalo et al., 2004	Non urgent vs. urgent and semiurgent users of ED	Age Sex Education Work as source of income Lives alone Immigrant	Weekend ED visit Off hours ed visit Ambulance transport to ED PCP f/u Specialist f/u	Perceived severity of illness Perceived General health ADLs # prior medical conditions # hospital admits past 3 years	
Andersen et al., 2000	HIV positive	Race Gender Education Age	Insurance Region Perceived access income	CD4 count Exposure group	
Bazargan et al., 1998 (LOC=locus of control)	Elderly AA	Age Gender Education Living arrangement Internal health LOC Chance health LOC Powerful others loc	Perceived tangible support Availability/access to MD Private insurance Medicare/caid Residential stability	Perceived health status Heart conditions Hypertension Other specific conditions	# of hospitalizations # of MD visits # ER visits
Broyles et al., 1999	Medically vulnerable i.e. elderly poor or uninsured	Elderly status Smoke/drink Race Marital status	Medicare Poor Uninsured Usual source of care Rural location MD rate per 100,000	Bad health Disability Hypertension Diabetes Cholesterol	Log visits
Frank et al., 1997	Older adults	Age Education Race Gender Marital status Health worry Age attribution Global health benefit Intentions Social desirability	Financial status Cost barrier Support barrier Difficulty rating Utility Specific health benefit Self-efficacy Communication Social support	ADLs Social activities Perceived health status Perceived seriousness Status of chief medical concern Recency Stability	Initiation of a health recommendation i.e. use of meds
Gamache et al., 2000	Homeless veterans	Gender Race Age Education Wartime service	VA eligibility Proximity to VA Medical center	Physical, psychiatric, or substance abuse problems	Lifetime use of VA medical, substance abuse, and psychiatric services

Authors/Year	Population	Predisposing	Enabling	Need	HSU/other
Henton et al., 2002	Medicare, home health care	Age Gender Marital status Education Race	Total personal income Urban/rural residence	Perceived health status Mental health status Cognitive impairment Functional impairment Vision impairment Hearing impairment	# of days of care Annual Medicare expenditures
Kilbourne et al., 2002	HIV	Age Gender Race HIV status Education level	Health insurance Income HIV provider type Region in United States	CD4 cell count AIDS comorbidity Psychiatric comorbidity Perceived Symptom intensity HIV medication use	Received care in past 6 months for symptoms yes/no
Lemming & Calsyn, 2004	Homeless SMI	Diagnosis Gender Education Ethnicity	Total income Support from professionals	Psychiatric symptoms Housing Physical health Perceived need	Case manager visits Total services
McCusker et al., 2003	>65yo				
G. C. Smith, 2003	Aging families of adults with SMI	Patient's age Mother/s education level	Informal support Family cohesion	Patient need Patient health Psychiatric symptoms Caregiver's need Mother's health Subjective burden Adverse age related changes	# of services used of 16 types of services
S. R. Smith et al., 1999	HIV infected individuals	Gender HIV status Marital status Race Age group Illness stage Education level Drug category	Income Insurance Home/less Psychological counseling	Health status t-cell count range	Ambulatory care visits (1-2 or >=3)

Table 2.3. Studies Using the BMVP

Authors/Year	Population	*Predisposing	*Enabling	*Need	HSU/other
(Desai et al., 2003)	Mentally ill homeless vets	*Age* *Gender* *Race* *Marital status* *Employment history* **History homelessness** **Mental illness**	Income past 30 days Veteran's administration benefits Physician referral for further services System level characteristics of facilities		
Gelberg et al., 2000	Homeless	*Age* *Sex* *Race* *Education* *Employed past 30 days* **Prison** **Crime victim** **Homeless # times** **Homeless months life** **Shelter type** **Severe mental illness** **Hospitalization for mental illness** **Alcohol and drug dependence** **Heavy drug and alcohol use past 30 days**	*Regular source care* *Insured* *Income past 30 days* *Social support* **Public benefits** **Competing needs past 60 days** **Personal safety past few days**	Any restricted activity Functional limits past 3 months General health Blood pressure Vision Skin problems Other health conditions	
Katerndahl & Parchman, 2002	Panic disorder	*Age* *Gender* *Race* *Education* *Marital status* **Acculturation** **Substance abuse** **Mental illness** **Psychological resources**	*Income past year* *Type of health insurance* *Available transportation* **Family support** **Family stress**	Self perceived health # of diagnosed chronic medical problems **Work disability** **Severity of panic symptoms**	Total # of ambulatory care visits

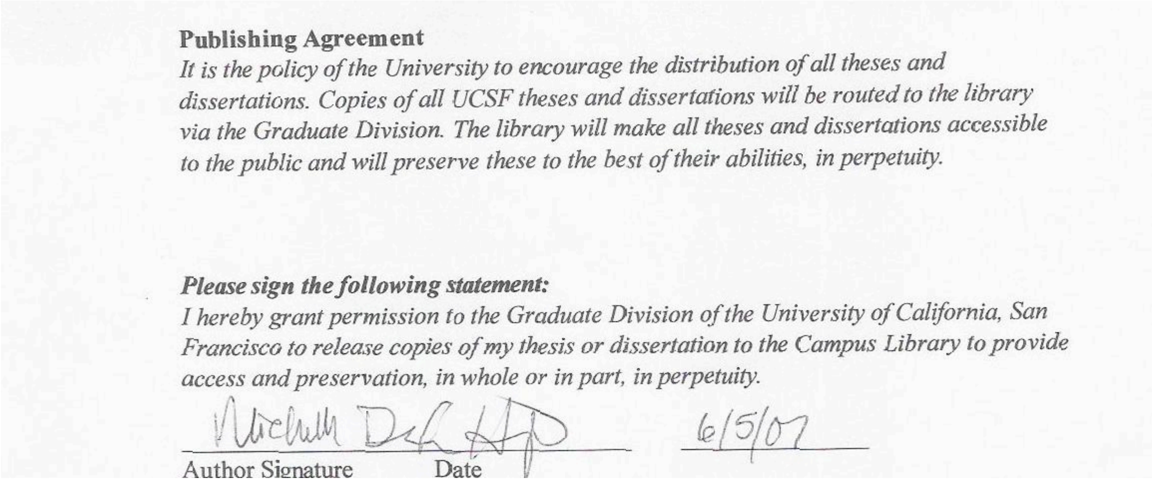
Authors/Year	Population	*Predisposing	*Enabling	*Need	HSU/other
Lim et al., 2002	Homeless women	*Age* *Marital status* *Pregnancy* *Race* *Education* *Employment* *Social contact* *Family support* **# of years homeless** **Type of housing** **History of assault** **Mental illness** **History of psychiatric hospitalization** **History of alcohol Or drug abuse**	*Regular source of care* *Health insurance* *Income* **Competing needs** **# of prompts to go for care**	Physical functional status # of serious symptoms in last 12 months # gynecological symptoms Health status History of abnormal pap smear Body mass index History of sexually transmitted disease	Hosp in past 12 months # outpatient visits (grouped counts) # health screens (goes up to 4)
Swanson et al., 2003	Homeless women	*Age* *Marital status* *Race* *Education* *Employment* *Pregnancy* *Children* *Social network* *Self esteem* *Perceived control* **# yrs homeless** **# episodes of homelessness** **Severity of homelessness** **Recent assault** **Past assault** **Mental illness** **History of psychiatric hospitalization** **Alcohol or drug abuse**	*Regular source of care* *Health insurance* *Income* *Appointment wait time* **Competing needs**	Perceived function Gynecologic condition Self reported health Body mass Index Sexually Transmitted Disease	Ambulatory care, # previous year Inpatient care, # admits previous year Preventive care (PAP in last yr) Site of last healthcare visit Waiting room duration Appointment duration

*Traditional domains are in *italics*. Vulnerable domains are in **bold**. Regular text if not differentiated by author.

Table 3.1. Variables and Operational Definitions *(Vulnerable domain variables in italics.)*

Model Category	Variable	Operational Definition
Predisposing	Race	Self-reported race
	Gender	Social gender (male or female/transgender)
	Age	Calculated age from date of birth to time of baseline interview
	Partnership status	Partnered with a significant other or not partnered
	Education	Number of years of education
	Homelessness	Homeless or not homeless
	Psychiatric diagnosis	Schizophrenia or mood/other disorder
	Self-esteem	Rosenberg self-esteem scale score
	Self-efficacy	0-100 rating on primary self-reported health problem
	Alcohol Use Ratio	Addiction Severity Index years of use / age
	Drug Use Ratio	Addiction Severity Index years of use / age
	Victim of violence	History of victimization in the past 6 months (yes or no)
	Days spent in jail	Lifetime number of days spent in jail
Enabling	Regular PCP	Having a regular physician or nurse practitioner
	Family support	Contact with family < once per month or at least weekly
	Social support	Contact with friend(s) < once per month or at least weekly
	Social Security benefits	Receipt of social security benefits (yes or no)
	Any outpatient program	Enrolled or not enrolled in an outpatient program
	Treatment group	Intervention group or usual care
	Social and occupational functioning	Global Assessment of Functioning score (GAF) (0-100 scale)
Need	Perceived health	Self-reported rating of current health at time of baseline interview (SF-36), dichotomized: good to excellent or fair to poor
	Evaluated health / Medical comorbidity	Duke University Severity of Illness summary score (DUSOI) (0-100 scale)
Health Behaviors	Number of Crisis Services Used	# of episodes billed for PES and other crisis services in 12 months
	Number of Inpatient Services Used	# of episodes billed for acute inpatient in 12 months
	Number of Residential Services Used	# of mental health and substance abuse residential episodes, and long term care admissions in 12 months
	Total # of days spent in inpatient	Sum of # of days per each episode of inpatient hospitalization over 12 months
	Total # of days spent in residential	Sum of # of days per each episode of residential care over 12 months
	Average length of stay inpatient	Calculated average of total # of days in inpatient hospitalization / number of episodes
	Average length of stay residential	Calculated average of total # of days in residential care / number of episodes
	Time to readmission	# of days from discharge from RCP to next admission to crisis, inpatient, or residential

PCP: primary care provider
BPC: basic primary care



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