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Exploring the Impact of Race on Mental Health Service Utilization Among African Americans and Whites With Severe Mental Illness

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Abstract:

Background: Disparities among African Americans and Whites with severe mental illness(SMI) have been identified in numerous studies. Yet it remains unknown if disparities are associated with race or other vulnerabilities common to this population. Objectives: This study used the Behavioral Model for Vulnerable Populations to examine mental health service utilization among 155 African Americans and Whites with SMI for 12 months after discharge from a residential crisis program. Design: This cross-sectional study was a secondary analysis of data from a randomized trial. Results: Race did not emerge as a significant predictor of mental health service utilization. Factors associated with frequency of service use were: diagnosis, age, drug use, gender, health benefit status, and enrollment in an outpatient mental health program. Conclusion: It is possible that the geographic location of the study, equal access to services, and equal rates of substance use between racial groups explain the lack of racial differences found in this sample.

Key Words: racial disparity, mental health service utilization, African Americans, severe mental illness

This study examined the impact of African American (AA) race on mental health service utilization among a group of individuals with severe mental illness (SMI). The term SMI is used here to refer to persons with schizophrenia spectrum, bipolar, and recurrent major depressive disorders, often considered the most debilitating of mental illnesses. The Institute of Medicine's report in 2003 extensively reviewed the healthcare literature regarding Whites and non-Whites in the United States and found overwhelming evidence that AAs (and other racial minority populations) have poorer health and treatment outcomes than do Whites in a number of specialty areas, including mental health (IOM, 2003). However limited research has explored additional inequities in care among SMI adults of AA race.

'Multiple identity status' is a term used by Sanders Thompson et al. to describe the experience of multiple levels of synchronous discrimination (Sanders Thompson, Noel, & Campbell, 2004); i.e. an experience in which the stress associated with belonging to one marginalized group could be compounded by belonging to another simultaneously. In their study of 1,827 SMI in the Consumer Operated Services Project, more than 50% of the participants reported experiencing discrimination as a result of mental illness; and of those who were AA, 65% also reported experiencing racial discrimination as well. Mental disability, race, physical disability, economic status, homelessness, and prison history were among the most common sources of discrimination reported by the participants and were shown to have a deleterious effect on psychiatric symptoms. However, the authors noted the difficulty of interpreting these data, as it was unclear if the primary source of distress was the specific type (e.g. race or mental disability) or the number of levels of discrimination experienced by the participants.

One of the clearest differences in mental health service utilization (referring to services obtained from a variety of mental health care providers in acute and community-based settings) between AA and White SMI is their site of care. AA SMI are more likely than Whites to receive care in emergency and inpatient settings, and less likely to be seen in outpatient programs that provide the ongoing care that might reduce the need for emergency and hospital readmissions (Barrio, et al., 2003; Kuno & Rothbard, 2005; McAlpine & Mechanic, 2000; Ojeda & McGuire, 2006; Sullivan & Spritzer, 1997). For example, McAlpine & Mechanic surveyed 9,585 SMI and found that AAs used more inpatient and emergency services than did Whites (McAlpine & Mechanic, 2000). Kuno and Rothbard also found a higher use of emergency services for AAs among a group of 2,515 adults with schizophrenia (Kuno & Rothbard, 2005). Similarly, outpatient studies indicated that Whites with SMI were more likely than AAs to utilize ambulatory care (Barrio, et al., 2003; Kuno & Rothbard, 2005; Ojeda & McGuire, 2006; Sullivan & Spritzer, 1997). The reasons for this disparity are unknown, but it could be related to greater access to outpatient services among Whites with SMI.

Because of greater acute service utilization, studies that examine the burden of race among SMI samples have largely been conducted in acute care settings. They report generally consistent findings. With few exceptions, AAs in these samples have a lower likelihood of receiving atypical versus conventional antipsychotics (Copeland, Zeber, Valenstein, & Blow, 2003; Herbeck, et al., 2004; Kreyenbuhl, Zito, Buchanan, Soeken, & Lehman, 2003; Mark, Palmer, Russo, & Vasey, 2003; Opolka, Rascati, Brown, Barner, et al., 2003; Opolka, Rascati, Brown, & Gibson, 2003, 2004; Valenti, Narendran, & Pristach, 2003); they receive significantly higher antipsychotic doses (Diaz & De Leon, 2002; dosReis, Zito, Buchanan, & Lehman, 2002; Valenstein, et al., 2004); and they are more likely to receive diagnoses of schizophrenia versus

affective disorders (Barnes, 2004; Butterfield, et al., 2004; Mathews, Glidden, & Hargreaves, 2002; Neighbors, Trierweiler, Ford, & Muroff, 2003; Strakowski, et al., 1996; Strakowski, et al., 2003; Trierweiler, et al., 2000).   However, it is difficult to distinguish the specific influence of race on disparate outcomes from other factors that may characterize acute care samples.

In fact, the studies that explore racial disparities among mental health outpatients and those with community samples do not report the same consistent findings. In a recent review of studies on race and diagnosis, DeCoux Hampton noted that overdiagnosis of schizophrenia was less likely to be reported among SMI in outpatient or general community samples (Decoux Hampton, 2007). One study by Zhang & Snowden that included more than 18,000 community dwelling adults in California found no differences in the rates of schizophrenia between AAs and Whites (Zhang & Snowden, 1999). This discrepancy might be explained by the study's inclusion of participants with a broader range of diagnoses than SMI (e.g., anxiety, substance use, personality, and eating disorders) as well as its lower representation of AAs (19.1%) than is typically seen in inpatient studies (average 46.6% AAs in the studies cited). However, race has also been a weak predictor of service utilization outcomes in other research studying services of varying acuity levels (Lemming & Calsyn, 2004).

In a number of studies, acute care samples shared characteristics known to predict overuse of services, particularly homelessness (Butterfield, et al., 2004; Mark, et al., 2003; Whaley, 2002) and substance abuse (Bolden & Wicks, 2005; Montross, et al., 2005). Within each of the above samples, these factors affected AAs disproportionately. For example, Folsom et al.'s study of 10,340 SMI in San Diego County found that homeless participants were four times more likely to use psychiatric emergency and inpatient services and 10 times more likely to use crisis residential treatment than non-homeless participants (Folsom, et al., 2005). In this

study, race itself was not a significant predictor of service use, but homelessness and having a

substance use disorder were; and both were significantly associated with AA race.

To extricate the impact of race from multiple and related predictors of health service

utilization, Lemming and Calsyn proposed the use of the Andersen Behavioral Model (Andersen,

1968; Lemming & Calsyn, 2004). This served as the theoretical framework for a 12-month

study of 3,855 homeless SMI enrolled in the federal ACCESS (Access to Community Care and

Effective Services and Supports) program. The Andersen model, used in prior research with

mentally ill populations (Desai, Rosenheck, & Kasprow, 2003; Keyes, et al., 2008), posits that

health service utilization is a function of three indicators: a) predisposing characteristics (i.e.

race, age, gender), b) enabling resources (i.e. health insurance and regular source of care), and c)

need (burden of symptoms or functional status). Using this approach, the investigators found

that utilization of all services, including psychiatric, medical, substance abuse, housing,

inpatient, and outpatient services, was increased among those who had substance abuse problems

and/or unstable housing (Lemming & Calsyn, 2004).

Gelberg, Andersen, and Leake's Behavioral Model for Vulnerable Populations (BMVP)

expands upon the Andersen model by separating predisposing, enabling, and need variables into

traditional (pertaining to the general population) and vulnerable domains (pertaining to high-risk

groups with multiple and competing needs) (Gelberg, Andersen, & Leake, 2000). It is especially

useful for examining disparities in health service utilization among SMI populations because it

incorporates vulnerability factors such as homelessness and substance abuse that are often

associated with race.

The BMVP was the framework for this study of AA and White severely mentally ill

adults recruited after an index episode of acute residential treatment. We followed this sample

for 12 months to gain a broader picture of mental health service utilization than a traditional cross-sectional approach could provide. Our goal was to determine the impact of AA race on acute care mental health service utilization over twelve months, controlling for predisposing, enabling, and need characteristics.

Methods

Research Design

This study was a secondary analysis of data collected for the "Clinical Trial of Wellness Training" between 2001 and 2004 in San Francisco, California (Chafetz, White, Collins-Bride, Cooper, & Nickens, 2008). Participants were recruited from four crisis residential units (CRUs) operated by Progress Foundation, a psychosocial rehabilitation organization that provides a range of residential programs in San Francisco (Chafetz, Collins-Bride, & White, 2004). Participants were randomly assigned to a basic primary care condition or to a 12-month health promotion intervention called Wellness Training (Chafetz, et al., 2008). Follow-up interviews were conducted at enrollment, 6, 12, and 18 months.   This secondary analysis did not test the intervention, but included treatment group as a covariate in the analyses. The study period extended from the index CRU discharge through 12 months. The institutional review board of the University of California, San Francisco approved this study.

Participants

Participants were admitted to CRUs as a voluntary alternative to hospital care following a referral from crisis services or an inpatient admission. All were enrolled at the same level of care with the same access to ongoing referrals with the typical length of stay at ≤ 14 days.

There were a total of 309 participants in the clinical trial and 205 of those were AA (n=73) and White (n=132), the racial groups of interest for this study. (The numbers of

participants in other racial groups were too small to perform a meaningful analysis.) All of the

AAs and Whites were among the pool of potential participants.

The inclusion/exclusion criteria resulted from an extensive review of mental health

service utilization billing records (see also *Data*). Several but not all participants had a lengthy

billing history and it was clear that they remained and used services within the county throughout

the duration of the study. Many others, however, did not use services at all or ceased to use

services early in the study period. As a result, their whereabouts had to be verified by alternate

methods. Therefore, efforts were made to distinguish non-use of services related to lack of need

from non-use related to inability associated with circumstances that would prevent use such as a

move out of the geographic area.

Participants were included who: 1) used a mental health service between 9 and 18

months after the index CRU admission (i.e. private psychiatrist, outpatient mental health

program visit, inpatient hospitalization, or psychiatric emergency or mobile crisis, etc.), 2)

completed follow-up interviews at 12 or 18 months, 3) *or* who had contact with research staff

(i.e. informal contacts on the street, phone calls) between 9 and 18 months per documentation in

tracking logs that. Participants were excluded who did not meet at least one of the above criteria,

relocated outside of San Francisco, withdrew from the study, or died. There were a total of 50

participants excluded from the sample leaving a total of 155 to be included in the secondary

analysis.

Data

Data (described below) were obtained from 1) interviews conducted at enrollment, 2)

CRU clinical records, and 3) mental health service utilization records. Variables representing

each domain of the BMVP were selected based on the literature review and availability of the

data collected in the clinical trial. The operational definitions of the variables used, the source of data, and the categorization into domains of the BMVP are shown in Table 1.

The interview guide included demographic items, several standardized assessment tools, and treatment group assignment. Trained research assistants conducted the interviews and collected general information on race, gender, and age based on participant self-report and administered the selected instruments according to recommended guidelines. The Global Assessment of Functioning Scale, an instrument that measures overall psychological, social, and occupational functioning,(Spitzer, Gibbon, & Endicott, 2000), was administered at baseline. Interviews also included the Lehman Quality of Life Interview, brief version (Lehman, 2000). This is an 86-item instrument used to assess quality of life and satisfaction in eight domains: living situation, daily activities and functioning, family, social relations, finances, work and school, legal and safety issues, and health. Selected data were extracted from this instrument to measure characteristics associated with increased vulnerability such as violent victimization, homelessness, and receipt of social security benefits.

Psychiatric diagnoses were obtained from CRU clinical records. The diagnoses were examined initially in four categories: schizophrenia-spectrum disorders (n=50), bipolar disorder(n=15), major depressive disorder(n=83), and other (n=7). After analyses revealed no significant differences between bipolar, major depressive, and other disorders with regard to socio-demographic variables and/or substance use outcomes, the three categories were combined and the variable was dichotomized to "schizophrenia" and "mood or other disorder."

Data on drug and alcohol use were obtained using relevant sections of the Addiction Severity Index (ASI) (McLellan, 2000). The ASI measures both lifetime and current substance use in 13 categories of potential substances used, i.e. alcohol, opiates, amphetamines, etc. Items

pertaining to cumulative lifetime use of drugs and alcohol to intoxication were used to calculate

two variables to reflect the long-term impact of substance use, ratio of lifetime drug use to age

and ratio of lifetime alcohol use to age (see Table 1).

Finally, mental health service utilization was measured by review of billing records.

These records were accessible in the participant's CRU clinical record and listed all mental

health care services billed to the county system of care. The outcome variables included counts

of the number of admissions to psychiatric emergency, inpatient, and CRUs that occurred within

the 12-month period. For example, if 3 separate admission dates appeared for psychiatric

emergency services within the 12 months post-CRU discharge, the participant was listed as

having 3 admissions.

The enabling variable, enrollment in an outpatient mental health program was also drawn

from mental health service utilization records. Outpatient mental health or community-based

services (including but not limited to case management and rehabilitation services), were listed

with the date the participant was initially enrolled as well as the date that the service was last

used. Because there was no way to determine the frequency of outpatient mental health service

use, this variable was dichotomized as use or non-use of the service. This variable was included

because Lemming & Calsyn reported higher use of health care services among SMI who

reported social support from professionals (Lemming & Calsyn, 2004).

Analysis

Associations between race and independent variables were examined. T-tests and Mann-

Whitney U-tests were used to compare continuous variables and chi-square tests were used for

categorical variables.

Because the service utilization outcomes were counts including a number of zeroes (for non-use of services) and were heavily skewed to the right, negative binomial regression, a variation of Poisson regression, was selected as the most appropriate method for hypothesis testing (Hardin & Hilbe, 2007). To check for goodness of fit, the result of the likelihood-ratio test was examined. Incidence rate ratio (IRR) and 95% confidence intervals were reported.

The Statistical Package for the Social Sciences, version 11.0 and STATA, version 9.2 were used to conduct analyses. Data were transferred from SPSS to STATA using the STAT/Transfer program. Statistical significance was set at $\alpha = .05$.

Results

General Sample Characteristics

Of the 205 AA and White participants in the original randomized trial, 155 met inclusion criteria for this study. Thirty-eight percent (n=59) were AA and 62% (n=96) were White. The mean age was 39.81 (±9.70), 72% were male (n=112), and 93% (n=144) were not partnered. Thirty-two percent (n=50) of participants were diagnosed with schizophrenia and 68% (n=105) with bipolar affective disorder, major depressive disorder, or other. The mean number of years of education was 11.93 (±2.81). Fifty-four percent (n=83) received social security benefits at the time of the study. And nearly all were enrolled in an outpatient mental health program (90%, n=139). Overall, the majority of participants reported lifetime use of some type of recreational drug and/or alcohol, 86.0% (n=134) for drugs and 94.2% (n=146) for alcohol.

In bivariate comparisons of each variable by race, AA participants were significantly more likely to be homeless, to have been a victim of violence, and to be in the intervention group (See Table 2). There were no significant differences between AA and White participants with regard to ratios for lifetime alcohol or drug use, enrollment in an outpatient mental health

program, receipt of social security benefits, or rate of schizophrenia diagnosis. Regarding outcome variables, AAs were significantly less likely to be admitted to residential treatment, but differences in inpatient and psychiatric emergency services were minimal and non-significant.

In the 12 months of follow-up, 62% (n=97) of participants were admitted to psychiatric emergency services at least once (range 1-15 admissions), 35% (n=54) to inpatient (range 1-5 admissions), and 68% (n=105) to residential services (range 1-9 admissions). Only four participants used long-term care services and these admissions were counted amongst residential admissions.

The results of the negative binomial regressions follow. The models predicting the number of each type of service admission controlled for variables selected to represent each domain of the BMVP: predisposing, enabling, and need.

Predictors Of Psychiatric Emergency Admissions

For psychiatric emergency admissions, the overall model was statistically significant (see Table 3). Variables that contributed significantly to predicting the number of psychiatric emergency admissions were: gender, age, ratio of lifetime drug use to age, receipt of social security benefits, and diagnosis. There were more psychiatric emergency admissions for participants who were: benefited (increased by a factor of 1.82 compared to non-benefited, p=.01) and diagnosed with schizophrenia (increased by a factor of 2.09 compared to other diagnoses, p=.004). A higher ratio of lifetime drug use to age (increased by a factor of 1.53 per one unit increase in ratio, p=.02) was also significantly associated. There were fewer psychiatric emergency admissions among participants who were female (decreased by a factor of .55 compared to males, p=.03) or older (decreased by a factor of .97 for each year increase in age, p=.01). Race was not a significant predictor of psychiatric emergency admission.

Predictors Of Inpatient Admissions

The overall model predicting inpatient admissions was not statistically significant (see Table 4). As a result, we were unable to determine reliable predictors for the use of this level of service. It is possible that the relatively low number of participants who used inpatient services (n=54) contributed to this result.

Predictors Of Residential Admissions

The overall model predicting residential admissions was statistically significant (see Table 5). The only significant predictor was enrollment in an outpatient mental health program, which increased residential admissions by a factor of 3.32 when compared to those who were not enrolled (p=.01).

Discussion

There were significant differences found between AAs and Whites in bivariate analyses with regard to homelessness (AAs 32%, Whites 15%, p=.01), violent victimization (AAs 36%, Whites 20%, p=.03), and number of residential admissions (AAs 1.22±1.51, Whites 1.82±1.82, p=.04). However, these differences were not apparent in the results of the regression analyses that controlled for predisposing, enabling, and need variables. Overall, this study found that psychiatric emergency admissions were predicted by all domains of the BMVP model; including predisposing characteristics (male gender, younger age, and higher ratio of lifetime drug use), enabling resources (social security benefits), and need (schizophrenia diagnosis) variables. None of the selected variables predicted inpatient admissions. And only enabling resources (enrollment in an outpatient mental health program) predicted residential admissions. Race was not a predictor in any of the regression models.

The negative finding of a racial disparity in mental health service utilization in this study is inconsistent with the majority of the published literature in this area. There are a number of reasons that might explain these results. First, this study took place in San Francisco, a city with a highly ethnically diverse population. Whites made up 49.7% of the city's total population, while Asians (30.8%), Hispanics/Latinos (14.1%), AAs (7.8%), and other groups comprised the other half of the population ("United States Census Bureau: State and County QuickFacts," 2000). This kind of diversity is not typically the rule in other United States communities and could have affected the negative finding of disparities in mental health services in this group. Furthermore, one of the stated goals of the San Francisco Department of Mental Health was to provide culturally sensitive care (DPH, 2007). It is unknown to what extent specific culturally-focused aspects of the mental health delivery system in San Francisco might have contributed to outcomes. However, it is possible that efforts to increase the availability of programs and providers that were directed at serving specific groups in their local areas might have been instrumental in increasing the level of comfort among non-White mental health consumers. This might have reduced perceived stigma and increased the likelihood that they would seek treatment when compared with consumers in less diverse areas.

Other aspects of the mental health service delivery system in San Francisco included efforts to reduce or eliminate out of pocket costs and the use of mobile outreach teams. These services could have served to increase accessibility and might explain the lack of racial disparity found in access to outpatient mental health services. Eighty-six percent of AAs and 93% of Whites were enrolled in outpatient mental health programs. Access to social security benefits (54% AAs benefited, 53% Whites) was also similar between groups, though low for both. Kuno & Rothbard's study of 1,995 SMI recruited from community mental health centers found that

racial disparities in service use were related to fewer available services in certain areas, i.e. those with lower incomes and a higher percentage of AAs in the community (Kuno & Rothbard, 2005). Therefore, in geographic areas where substantial access barriers exist between races (not the case in our study), disparities might be more readily detected.

Another and perhaps the most important consideration with regard to the lack of apparent racial disparities in our study is the statistically similar ratios of lifetime drug (AA=.53, Whites=.64, p=.23) and alcohol (AA=.63, Whites=.71, p=.26) use to age between the racial groups. Results from studies by Prince; Folsom et al.; and Rothbard et al. each reported an association between drug use and use of acute care psychiatric services (Folsom, et al., 2005; Prince, 2007; Rothbard, Min, Kuno, & Wong, 2004). There were also numerous studies that indicated that the use of certain substances was higher among AAs than other racial groups (Butterfield, et al., 2004; Chen, Swann, & Johnson, 1998; Chung, Mahler, & Kakuma, 1995; Compton, et al., 2000; Copeland, et al., 2003; Grella & Stein, 2006; Montross, et al., 2005). In one study of 292 AA and non-AA inpatients, Trierweiler et al. found that while racial disparities in the diagnosis of schizophrenia were found before controlling for substance abuse, these differences were no longer significant after controlling for it (Trierweiler, et al., 2000).

The results of the aforementioned studies strongly suggest that the influence of substance abuse is a critical component to include in any research pertaining to SMI individuals. Numerous studies have shown that SMI who use substances experience more negative outcomes when compared to those who do not use or whose use is less severe. In the case of our study, there was no difference in the use of substances between AAs and Whites (who both had high rates of reported substance use) and as a result, the likelihood of detecting a racial disparity was diminished.

Strengths

This study has several strengths. It was a secondary analysis of a prospective randomized controlled trial, so service utilization outcomes were obtained over a 12-month period. This was an adequate amount of time to observe service use patterns.

The study also used a theoretical framework specific to vulnerable populations to guide the analysis. Participants were recruited at the same level of care and had conceivably the same treatment options within the health care delivery system. Therefore, this sample represents a clinically similar group of adults with SMI. Data on service use were obtained from mental health service utilization records that were considered to be highly reliable. Measures of several predictor variables were obtained from the use of standardized measures with established reliability and validity.

Limitations

Because participants were initially enrolled in a randomized trial, there may be inherent differences in persons who agree to participate in such a study and those who do not. Furthermore, the participants were recruited at a relatively acute stage of illness and admitted to a short-term residential program. Though they were released to the community, it is unknown how the lower level of functioning at enrollment with this sample might compare to a stable outpatient group. Also, some of the data utilized as predictor variables came from self-report data. Nonetheless, Chafetz et al. and Goldberg et al. reported that individuals with SMI can give reliable self-report on recent service use and life events (Chafetz, Havassy, & Arean, 1997; Goldberg, Seybolt, & Lehman, 2002).

Outpatient mental health program enrollment was a variable obtained from mental health service utilization records; however, frequency of visits was not. As a result, it is impossible to

distinguish differences in outcomes related to the amount of outpatient service use. Folsom et al.

reported that a lower frequency of outpatient service use was significantly associated with higher

use of residential, inpatient, and psychiatric emergency services among the homeless (Folsom, et

al., 2005).   This data might have provided a more meaningful interpretation of enabling

resources in this sample.

Despite these limitations, this study indicates that all domains of the BMVP

(predisposing characteristics, enabling resources, and need) had the potential to contribute to the

prediction of mental health service utilization with variability depending on the level of acuity,

but race was not among the predictors. Unlike many previous studies, ours did not detect

significant racial differences in mental health service utilization, but caution should be exercised

in interpreting these results as evidence that racial disparities did not exist. Instead, the results of

this study might indicate that 'multiple identity status,' a prominent issue in this sample, rather

than creating additional burden might have instead thwarted the appearance of disparity in this

group. Most participants experienced multiple levels of potential vulnerabilities that are

traditionally associated with discrimination including homelessness, substance use, and a lack of

health benefits among others. These vulnerabilities when occurring simultaneously have the

potential to nullify the influence of race particularly in an already marginalized or stigmatized

group such as individuals with SMI.   Therefore, future research pertaining to racial disparities

in mental health care among individuals with SMI should be certain to consider the influence of

race within the context of essential vulnerable characteristics such as substance use and

homelessness that are in many communities more prevalent among African Americans.

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Table 1. Selected Variables and Corresponding Domains for the Behavioral Model for
Vulnerable Populations

Predisposing (factors existing before the onset of illness)

	Operational Definition	**Data Source**
Race	African American or White race	Self-report, interview
Gender	Male or female	Self-report, interview
Age	Calculated from date of birth	Self-report, interview
Victim of Violence	Self-reported victim of a violent crime in past 6 months, yes or no	Quality of Life Interview, brief version
Homeless	Self-reported usual residence over past 6 months-homeless vs. any housing (shelter, family, board and care, etc)	Quality of Life Interview, brief version
Ratio of Lifetime Drug Use	Cumulative lifetime years of substance use (in 11 categories) divided by age	Addiction Severity Index
Ratio of Lifetime Alcohol Use	Cumulative lifetime years of alcohol use & use to intoxication divided by age	Addiction Severity Index

Enabling (conditions that permit the use of services)

Study Group	Intervention group or basic primary care	Random assignment at enrollment
Enrolled in outpatient mental health program	Any use of an outpatient mental health program between 9 and 18 months	Mental health service utilization records
Social security benefits	Self-reported receipt of benefits, yes or no	Quality of Life Interview, brief version

Need (perceived and evaluated)

Diagnosis	[Schizophrenia] vs. [bipolar, major depression, or other disorder]	Clinical records
Overall psychological, social, and occupational functioning	0-100 score, higher scores indicating higher functioning	Global Assessment of Functioning Scale

Health Service
  Utilization (in 12 months)

Psychiatric emergency	Number of psychiatric emergency or mobile crisis admissions	Mental health service utilization records
Inpatient	Number of acute inpatient admissions	Mental health service utilization records
Residential	Number of mental health or substance abuse admissions or long-term care	Mental health service utilization records

Italics=vulnerable characteristics

Table 2. Descriptive Comparisons of AAs and Whites: Results of Chi-Square and T-test Analyses

Variable	AA		White		
	n	%	n	%	p
Male vs. Female	39	76	73	66	.18
Homeless vs. housed	19	32	14	15	.01
Victim of violence vs. not	21	36	19	20	.03
Benefited vs. non-benefited	32	54	51	53	.89
Enrolled in outpatient program vs. not enrolled	50	86	89	93	.19
Intervention group vs. control	36	61	43	45	.05
Schizophrenia vs. mood or other diagnoses	20	34	30	31	.73
No psychiatric emergency services used vs. any	24	41	34	35	.51
No inpatient services used vs. any	37	63	64	67	.62
No residential services used vs. any	25	42	25	26	.04
	Mean	S.D.	Mean.	S.D	p
Age	40.12	9.04	39.62	10.13	.76
Lifetime drug use ratio	.53	.44	.64	.68	.23
Lifetime alcohol use ratio	.63	.44	.71	.43	.26
Number of psychiatric emergency admissions	2.03	3.15	1.96	2.63	.87
Number of inpatient admissions	.73	1.20	.61	1.10	.55
Number of residential admissions	1.22	1.51	1.82	1.82	.04

Table 3. Negative Binomial Regression Predicting Psychiatric Emergency Service Admissions
PSYCHIATRIC EMERGENCY SERVICES, N=149, χ^2=27.56, p=.01

	IRR	Standard Error	p	95% CI
AA vs. White	1.15	.27	.56	.72-1.82
Female vs. male	.55	.15	.03	.32-.93
Age	.97	.01	.01	.94-.99
Victim of violence vs. non-victim	1.16	.32	.59	.68-2.00
Homeless vs. housed	.96	.3	.91	.52-1.77
Lifetime drug use ratio	1.53	.29	.02	1.06-2.21
Lifetime alcohol use ratio	1.08	.3	.79	.62-1.87
Intervention group vs. control	1.01	.23	.98	.64-1.58
Enrolled in outpatient program vs. not enrolled	.81	.35	.63	.34-1.91
Benefited vs. non-benefited	1.82	.44	.01	1.13-2.92
Schizophrenia vs. mood or other diagnoses	2.09	.53	.004	1.27-3.43
GAF score	.97	.02	.12	.93-1.01

Table 4. Negative Binomial Regression Predicting Inpatient Admissions
[†]INPATIENT SERVICES, N=150, χ^2=15.88, p=.15

	IRR	Standard Error	p	95% CI
AA vs. White	1.21	.37	.54	.66-2.21
Female vs. male	.69	.26	.33	.33-1.44
Age	1.00	.02	.87	.97-1.03
Victim of violence vs. non-victim	1.05	.41	.89	.49-2.27
Homeless vs. housed	.59	.23	.17	.27-1.27
Lifetime drug use ratio	1.77	.42	.02	1.11-2.82
Lifetime alcohol use ratio	.77	.28	.48	.38-1.58
Intervention group vs. control	.77	.23	.37	.43-1.37
Benefited vs. non-benefited	1.96	.33	.04	1.04-3.69
Schizophrenia vs. mood or other diagnoses	1.30	.43	.43	.68-2.47
GAF score	.97	.03	.20	.92-1.02

[†]Enrollment in an outpatient program was dropped from the model due to the low number of participants using inpatient services and the low number of participants who were not enrolled in an outpatient mental health program.

Table 5. Negative Binomial Regression Predicting Residential Admissions
RESIDENTIAL SERVICES, N=149, $\chi^2=22.08$, p=.04

	IRR	Standard Error	p	95% CI
AA vs. White	.74	.14	.11	.52-1.07
Female vs. male	.86	.18	.46	.58-1.28
Age	.99	.01	.33	.97-1.01
Victim of violence vs. non-victim	1.01	.22	.96	.66-1.54
Homeless vs. housed	.96	.21	.86	.62-1.48
Lifetime drug use ratio	1.23	.17	.14	.94-1.61
Lifetime alcohol use ratio	1.00	.21	.98	.66-1.52
Intervention group vs. control	1.02	.17	.88	.74-1.43
Enrolled in outpatient program vs. not enrolled	3.32	1.43	.01	1.43-7.70
Benefited vs. non-benefited	1.13	.20	.49	.80-1.61
Schizophrenia vs. mood or other diagnoses	1.27	.24	.20	.88-1.83
GAF score	.99	.01	.53	.96-1.02