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Street Medicine: A Program Evaluation

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ABSTRACT

STREET MEDICINE: A PROGRAM EVALUATION

By

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INTRODUCTION: Homeless individuals have poorer health outcomes than their housed counterparts, yet there are many barriers to receiving consistent medical and behavioral health care. Street Medicine is a method of health care delivery in which a multidisciplinary group of health care providers bring health care to people living on the streets. Street Medicine could be a promising solution to meeting the unmet health needs of people experiencing homelessness.

AIM: The purpose of the evaluation was to examine the effectiveness of Mercy Care's Street Medicine program at engaging their homeless patients in consistent care and decreasing the number of patients that seek unnecessary hospital services.

METHODS: A retroactive medical records review was conducted for 284 patients. Of the 284 patients, 26 patients had to be excluded from data analysis because the patients had not been seen during the Street Medicine rounds and are not considered Street Medicine patients. All of the data that were extracted were collected using a computer-based data collection form. The data was analyzed using frequency tables and t-tests in SAS.

RESULTS: Results suggest that 54.26% of the Street Medicine patients are connected to Mercy Care through Street Medicine and/or clinic visits and engaging in consistent primary care and behavioral health care services. The average number of total Street Medicine encounters per patient was lower than the average number of clinic encounters. For both Street Medicine and clinic encounters, the patients accessed more primary care services than behavioral health services and case management services. There was no significant difference in ED visits before or after the initial Mercy Care encounter. The average number of total hospital admission days significantly increased from 0.98 days before the patient's initial Mercy Care encounter to 1.84 days after the initial Mercy Care encounter.

DISCUSSION: The Street Medicine program may be a promising solution for getting and keeping people experiencing homelessness engaged in health care and decreasing the number of patients that turn to the hospital for avoidable and costly health care services. The Street Medicine program eliminates many of the barriers to care that people experiencing homelessness face and could potentially decrease the rates of morbidity and mortality in this vulnerable community.

STREET MEDICINE: A PROGRAM EVALUATION

by

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Author's Statement Page

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I. Introduction

Health Disparities Among Homeless Population

Homelessness is an urgent public health problem. People experiencing homelessness have poorer health outcomes than non-homeless people (Oppenheimer, Nurius, & Green, 2016). For example, homeless people have increased rates of acute and chronic diseases and mortality (Henwood, Cabassa, Craig, & Padgett, 2013). A study from Massachusetts asserts that people experiencing homelessness are more likely to die from drug overdose and cancer and heart disease at rates of 16- to 24-fold and 2- to 3-fold higher, respectively, than the general population (Baggett et al., 2013). These poor health outcomes are due to inadequate living conditions, violence and trauma, and drug and alcohol abuse among many other factors. Even though homeless people are in most need of health care, they are the least likely to receive adequate health care if any health care at all. When they do access the health care system, it usually through expensive, and often avoidable, Emergency Department (ED) visits that are paid for through public funds (Ku et al., 2014). It is imperative that we have programs available to homeless people that will provide them with cost-effective, appropriate, and meaningful health care services.

Homelessness in Georgia

In Georgia, there are almost 14,000 documented homeless individuals. Of the 14,000 homeless people, 65% are African American, 31% are White, and 4% are Multi-racial or other (Georgia Department of Community Affairs, 2015). According to a needs assessment conducted by Mercy Care in the metropolitan Atlanta area, homeless clients asserted that the top unmet health care needs were primary care, dental care, and mental health treatment (Laswell, 2015).

The homeless clients also reported that the main barriers to care in Atlanta are lack of income,

lack of insurance, transportation, lack of information about where to access services, wait

times, and limited coordination among care providers (Laswell, 2015). Because of the expressed

unmet health care needs and barriers to care, many of the homeless people in the metro

Atlanta area do not have a consistent source of health care that caters to their needs.

Street Medicine

Street Medicine is model of service delivery that employs the use of multidisciplinary

mobile outreach teams that provide care to homeless populations living on the street (Howe,

Buck, & Withers, 2009). The main goal of Street Medicine is to increase access to care for

homeless patients by decreasing barriers that often cause homeless individuals to resist the

health care system. By providing health care to unsheltered homeless people on the streets, in

homeless encampments, abandoned buildings, etc., Street Medicine eliminates the issues of

transportation, lack of insurance or financial resources and long wait times. The unconventional

setting helps to create a sense of trust between the health care providers and the patients and

offers a more positive experience with the health care system. When Street Medicine programs

collaborate with other community hospitals, clinics, and providers, they eliminate the problems

of lack of coordination of care and lack of information about where to access services.

Therefore, Street Medicine may be a promising model of service delivery that will connect

homeless patients to consistent health care services. It may also be effective in decreasing the

number of homeless patients that seek avoidable ED care.

Mercy Care developed its Street Medicine program in 2013. The program consists of a

multidisciplinary team that provides primary care, psychiatric services, and social support

services for homeless patients living on the streets. The goal of the program is to engage

homeless individuals in consistent medical care services and create a medical home for

homeless patients in hopes that it will decrease the number of patients that seek avoidable ED

and hospital services. Though the Street Medicine program has been providing services to

homeless patients for over 3 years, no data has been collected to report on the effectiveness of

the program in engaging homeless patients in consistent medical care services such as primary

care and behavioral health services.

Purpose of the Evaluation

The purpose of the evaluation is to examine the effectiveness of Mercy Care's Street

Medicine program at engaging their homeless patients in ongoing care and decreasing the

number of patients that seek unnecessary hospital care and ED services. The outcomes of

interest include (1) the number of patients that were seen during Street Medicine rounds; (2)

the percent of Street Medicine patients that were seen at a Mercy Clinic or mobile clinic

location; (3) the percent of Street Medicine patients were seen consistently; (4) the types of

services in which the patients engaged; (5) the number of ED visits; and (6) the number of

hospital admissions. The data was collected through a retrospective medical record review at

Mercy Care, with access to Grady Hospital records through Mercy Care as well, and analyzed

using frequency tables and t-tests in SAS. The findings will be used as a guide to make quality

improvement changes to the program.

II. Review of the Literature

Barriers to Health Care

In order to provide more positive health care experiences for the homeless patients, it is important to explore the barriers to health care through the eyes of the homeless patients. Nickasch and Marnocha (2009) attempted to investigate these experiences by conducting interviews with homeless individuals in northeastern Wisconsin who are over the age of 18 years. The researchers concluded that most of the homeless people that were interviewed believed that they had no control over their own lives and health, and most of the barriers were due to external forces (Nickasch & Marnocha, 2009). The barriers that were frequently mentioned during the interviews included: 1) lack of attainment of physical needs; 2) lack of affordability; 3) lack of available resources; and 4) lack of compassion of health care providers (Nickasch & Marnocha, 2009).

Martens (2009) also examined the barriers to adequate health care often faced by homeless individuals. The researcher conducted a literature search on health care access for homeless people. The search included subgroups of homeless people such as children and adolescents, women, families, veterans, and mentally disordered (Martens, 2009). The data collected from the literature search were from research articles published between 1988 and 2008. Martens found that lack of respect and judgementalism from providers and stigma negatively affect treatment seeking behavior for homeless people (2009). The research also concluded that lack of insurance or underinsurance, immobility due to sickness, transportation problems, and confusion and inadequacy of health care system also have a negative impact on homeless individuals (Martens, 2009).

Homeless Patients and ED Use/Hospitalizations

Homeless people often do not have consistent follow-up with primary care and use emergency room and inpatient hospital services at higher rates when compared to non-homeless people. Lebrun-Harris et al. (2013) conducted a study assessing the health status and health care experiences of patients who are homeless versus their housed counterparts in federally supported health centers. The researchers analyzed cross-sectional data on 2,683 adult homeless patients from the 2009 Health Center Patient Survey, which is a nationally representative survey funded by the Health Resources and Services Administration. This survey was conducted using personal interviews with questions that focused on homeless status, sociodemographic characteristics, health status, medical conditions, access to care and utilization of services. The study concluded that homeless patients were twice as likely as housed patients to have unmet health care needs (medical care, prescription management, dental care, and mental health care) and an emergency room visit within the past year (Lebrun-Harris et al., 2013). Lebrun-Harris et al. found that homeless patients had three times the odds of reporting ED visits as a usual source of health care when compared to housed patients and twice the odds of being heavy users of ED services (2013).

Wen-Chieh, Bharel, Jianying, O'Connell, and Clark (2015) assessed factors that are associated with frequent hospital and ED utilization among 6,494 homeless people with Medicaid in Massachusetts. The results of the study show that more than 70% of the hospitalizations were acquired by only 12% of the sample. More than 70% of the ED visits were acquired by only 21% of the sample. Homeless people with co-occurring mental illness and substance use disorders present the greatest risk for frequent hospitalizations and ED visits

(Wen-Chieh et al., 2015). The researchers believe that the increased risk for homeless people

with mental illness and substance use disorders stems from challenges in locating behavioral

health services and in coordination of care, lack of relationship with providers, and a shortage

of behavioral health providers.

Negative perceptions of health care providers also increase ED use among homeless

patients. Many ED providers believe that homeless individuals will not follow up with a regular

primary care provider due to the assumption that homeless people are "highly mobile" or

transient. Because many EDs often advise homeless patient to return for non-emergent health

care needs, this increases dependence on ED use and leads to overcrowding (Parker & Dykema,

2013). The researchers wanted to challenge this notion of high mobility and transience by

conducting a cross sectional study with a sample of 674 homeless adults recruited from a large

homeless shelter in South Carolina. Parker and Dykema's research was counterintuitive to the

idea that homeless patients are highly mobile and transient. The researchers concluded that

many homeless people tend to stay in the same state or city in which they first became

homeless (2013). The researchers further concluded that because homeless patients are not

highly mobile, ED physicians should put more effort into providing homeless patients with

primary care referrals to reduce ED use (Parker & Dykema, 2013). Parker and Dykema assert

that referrals to non-ED sources of care may produce considerable cost savings for the

organization and the health care system as whole (2013).

Homeless patients represent a small subgroup of frequent ED users, however these

patients incur expensive health care bills for acute care services that are subsidized by the

public (Ku et al., 2014). If the researchers are able to quantify the economic burden that

frequent ED users place on health care expenditures, policymakers can properly address high

ED expenditures with targeted interventions. The need for this kind of information led Ku et al.

(2014) to study the ED costs of frequent users, both homeless and non-homeless, by conducting

a retrospective cross sectional medical record review for ED visits at an urban academic medical

center. Ku et al. found that 74 homeless patients that were considered frequent users accessed

the medical center ED 845 times in one year (2014). Homeless frequent users utilized the ED

more often than non-homeless frequent users with charges that add up to almost $5 million in

one year, which is estimated to be $64,000 per homeless patient that is a frequent user (Ku et

al., 2014). The amount in hospital charges for the top five homeless frequent users was almost

$2 million for one year with the top user incurring almost $500,000 alone (Ku et al., 2014).

Improving Access to Primary Care and Mental Health Services

Homeless people have been shown to have higher rates of mortality and morbidity than

their housed counterparts and present a greater need for primary care. However, there are

many barriers that hinder homeless individuals from receiving ongoing primary care services

such as absence of insurance, transportation issues, and distrust of the health care system to

name a few. Health Quality Ontario (2016) performed a systematic review to study the

effectiveness of interventions that aim to increase access to primary care among homeless

people who live in urban areas and lack serious mental illnesses. The researchers reviewed

4,047 citations and isolated five studies that discussed intervention strategies used to improve

access to primary care services for homeless people (Health Quality Ontario, 2016). The

intervention strategies included clinic orientation with or without outreach services, integration

of primary care services with other services for homeless individuals, and provision of housing

and supportive services. Of these interventions, clinic orientation to available services with or without outreach services proved to be the best method for improving access to primary care services.

O'Connell et al. (2010) completed a review on the Boston Health Care for the Homeless Program (BHCHP). BHCHP began providing comprehensive primary health care services in 1985 to homeless individuals in Boston. In addition to providing services in a clinical setting, health care providers also provide services directly to homeless patients on the streets. A small, multidisciplinary team of health care providers delivered continuous primary care to patients living in alleys, under bridges or in front of doorways in order to build rapport with these homeless communities. The evidence supported that "street medicine" rounds were effective for treating and preventing chronic diseases. The street medicine rounds helped homeless patients to regularly receive flu vaccines, TB skin tests, screenings for hypertension, and screenings for diabetes (O'Connell et al., 2010). The researchers note that 79% of the homeless patients obtained or were recommended for a flu vaccine. Of the patients that were women, 45% had Pap tests, and 56% had mammograms (O'Connell et al., 2010).

Hwang and Burns (2014) conducted a study of interventions that can be used to improve the health of homeless people. The researchers targeted homeless individuals in high-income countries, like many other studies. The study focused on interventions for primary health care services, mental health care services, permanent supportive housing, medical respite programs, substance users, and homeless young people (Hwang & Burns, 2014). The researchers performed an observational study in the US at five clinical care sites. Hwang and Burns concluded that primary care programs that were tailored to homeless patients were

rated higher in quality of care than primary care programs that are not tailored to homeless patients. The tailored primary care programs included active outreach, case management, partnerships with community organizations, and community advisory boards (Hwang & Burns, 2014).

Active outreach has also been used to improve access to mental health care for people experiencing homelessness. Bond, Drake, Mueser, and Latimer (2001) conducted a literature review to discuss the effectiveness and cost-effectiveness of one active outreach model in particular – assertive community treatment (ACT). The ACT model is a community care model in which a multidisciplinary team of professionals helps people with severe mental illness successfully integrate into the community (Bond et al., 2001). The study concluded that ACT significantly reduced psychiatric hospital utilization, increased housing stability, and improved the perception of quality of life. ACT engaged patients in mental health treatment and increased 1-year retention in services from 54% to 84% (Bond et al., 2001). When compared with standard after care and low intensity case management, ACT reduced hospitalizations by 78% and 58%, respectively. Though intensive ACT services were costly, the reduction in hospitalization costs was able to significantly offset the costs of ACT. Even when compared with other services, ACT resulted in lower overall costs (Bond et al., 2001).

Young, Barrett, Engelhardt, and Moore (2014) assess ACT as an effective intervention for improving mental health and stable housing for people experiencing homelessness. The study examines outcomes for mental health, housing stability, and substance use pre-ACT and six months post-ACT as well as patient satisfaction and engagement. The proportion of participants that reported stable housing increased from 17.6% to 39.2% (Young et al., 2014).

There were a significant number of reported gains in global mental health symptomology and less frequent episodes of depression and anxiety. However, there was no significant changed in reported substance use. Though a majority of the participants (78.4%) were satisfied with ACT, the participant engagement was equal to the CEST normative average (Young et al., 2014).

Street Medicine is becoming one of the leading models for the delivery of primary and mental health care services to homeless patients due to its street outreach/ACT component. However, because of the unconventional setting in which Street Medicine is carried out, it is often difficult to assess quality management concerns. Howe, Buck, and Withers (2009) conducted a qualitative analysis on eight programs from the 2007 and 2008 presentations from the annual International Street Medicine Symposia. The goal of the analysis was to outline the contextual components that impact quality management and define present quality management practices used in Street Medicine programs (Howe et al., 2009). The contextual components identified in the analysis that impact quality management included unconventional living arrangements and deficiency of financial resources for homeless patients, inconsistent contact with populations of homeless patients that are transient, and informal clinical settings (Howe et al., 2009). The best practices for Street Medicine programs that deliver high quality of care included the use of mobile clinic vans, the development of electronic medical records that are unique to Street Medicine, collaboration among community clinics and providers, and the provision of social support services (Howe et al., 2009). Though this study only presents preliminary data, it marks an opportunity for further studies into quality management for Street Medicine programs.

Previous research indicates that there are two challenges that must be overcome in order to provide homeless patients with meaningful health care. One challenge is to find a way to decrease the barriers to health care that homeless people often face and provide them with a more positive experience with the health care system. The second challenge is to decrease the number of patients that turn to the hospital for avoidable and costly health care services. Upon reviewing the literature, there is not a lot of research about Street Medicine, but it seems that the street outreach component of street medicine may make it a method of health care delivery that can address these challenges.

III. Program Description

About Mercy Care

Mercy Care is a Federally Qualified Health Center that serves 11,392 patients, 88% of whom are uninsured and 62% of whom are homeless. It is also the only Healthcare for the Homeless program in Atlanta. There are eight clinics and five mobile sites all over the metro Atlanta area that provide primary care, pediatric care, dental and vision services, health education, behavioral health services, and HIV treatment regardless of insurance status.

Community outreach is an important part of Mercy Care. The Community Homeless Outreach Program aims to build rapport with homeless people who are street bound and provides referrals for housing, clothing, food, and medical and behavioral health services. The HIV Prevention Outreach Team provides screenings and community events that provide information about HIV and prevention. The Family Health Promotion program provides health information and encourages healthy lifestyles among the immigrant Latino community.

Street Medicine Program

Recognizing the dire need for health care services among unsheltered individuals living on the streets, Mercy Care started their Street Medicine program in 2013. The purpose of the Street Medicine program is to engage unsheltered individuals in the metro Atlanta area and provide them with physical and mental health care in the places where they live and sleep. This program strives to provide physical and mental health care directly on the streets to reduce morbidity and mortality, assist homeless individuals with obtaining housing, and educate future healthcare providers to provide culturally competent healthcare to street-bound homeless individuals. By doing so, the Street Medicine program hopes to improve the relationship

between the homeless community and the health care system and reduce the barriers to

health care access.

The Street Medicine team consists of family and internal medicine physicians, a

psychiatrist, a registered nurse, a peer specialist and student volunteers. This team gathers 6 to

8 team members and completes Street Medicine rounds once a week on Wednesdays for four

hours (6:00pm to 10:00pm) traveling in a van to street corners, doorways of abandoned

buildings, and under bridges. The team introduces themselves to new clients to engage them in

the health care system and follows up with current clients to ensure continuity of care. Once

the patients are established, the Street Medicine program uses its partnerships with other

organizations and Mercy Care clinics to provide additional health care services and social

support services. This method of outreach allows providers to meet homeless patients where

they are in order to build trusting relationships with these communities and provide better

health care. The ultimate goal of the program is to provide homeless patients with a consistent

source of care according the program's Logic Model (Figure 1).

IV. Methods

Evaluation Design

The Street Medicine Program has been operating since 2013 and has predetermined

goals and objectives as referenced in the program's Logic Model in Figure 1. Using the goals and

objectives from the program theory as standards for the evaluation, an outcome evaluation

design was selected as the best method for this evaluation. This type of evaluation will be used

to assess how well the program achieved its intended outcome, which is engaging homeless

patients in regular follow-up with primary and behavioral health services at Mercy Care.

Data Collection Procedures

Medical Record Review

A retrospective medical records review was conducted to gather data for the evaluation.

A list of 284 patients was provided for data extraction based on a Street Medicine

administrative report. Of the 284 patients, 26 patients had to be excluded from data analysis

because the patients had not been seen during the Street Medicine rounds and but may have

been patients that were seen via telemedicine. All of the data that was extracted was collected

in a computer-based data collection form.

The medical record review included data collected from Mercy Care and Grady Hospital.

The data collected from Mercy Care contained information about patient encounters from the

dates of January 1, 2015 through September 31, 2016. Though the Street Medicine Program

began in 2013, Mercy Care switched to a new electronic medical record system in 2015, and the

previous data was unable to be recovered. The data collected from Grady Hospital contained

information about patient encounters for all dates prior to the first encounter with Mercy Care

through September 31, 2016.

Protection of Patient Health Information

The medical records are stored and maintained at Mercy Care using electronic health

record software. The information can only be accessed using a login name and password

generated from Mercy Care's administrative office upon participating in a HIPPA training

program and clinic orientation. Any remote access to medical records must also be approved

through Mercy Care's administrative office and a login and password must be provided to the

user.

The computer-based data collection form was encrypted in order to protect the

patient's information. All of the protected patient information for data extraction was

transferred from the program's attending physician to the computer-based data collection form

using a portable storage device and took place at Mercy Care. The files on the storage device

were also encrypted for the protection of the patient's information.

Measures

Number of Patients with Street Medicine Encounters

Street Medicine encounters were an important source of information for assessing

medical treatment accessed by homeless patients. A visit was considered a Street Medicine

encounter if the patient's visit took place on a Wednesday between the hours of 6:00pm and

10:00pm, which is the day and time that the Street Medicine Team conducts their rounds. The

indicators to assess Street Medicine encounters included 1) the patient's total number of Street

Medicine visits, 2) the number of visits that were behavioral health visits, and 3) the number of

visits that were primary care visits.

Number of Patients with Clinic Encounters

The clinic encounters were vital for assessing treatment as well. The indicators to assess

clinic encounters included 1) the patient's total number of clinic visits, 2) the number of visits

that were behavioral health visits, 3) the number of visits that were primary care visits, and 4)

case management visits. Case management is one of the services that was provided in the

clinics. Case managers help patients to get Social Security benefits, housing assistance, clothing

assistance, food assistance, transportation services, etc. This indicator was added for additional

information about services that were accessed in the clinic.

Consistent Medical Care

An outcome that was vital to assess the effectiveness of the Street Medicine program

was the number of patients that were regularly following up with a health care professional in

the clinic and during Street Medicine rounds. Based on previous follow up interval studies

[Schwartz, Woloshin, Wasson, Renfrew, & Welch (1999); Buscher et al. (2013); Welch, Chapko,

James, Schwartz, & Woloshin (1999)], a patient was considered to be regularly following up if

the intervals between the visits were 6 months apart or less. An indicator to assess consistency

of medical care was the patient's connection status to Mercy Care. Patients that were labeled

"Started" were new patients at the time of their first Street Medicine encounter and were

regularly following up leading to the end date of the record review. Patients that were labeled

"Already Connected" were already being seen at a Mercy Care clinic location at the time of

their first Street Medicine encounter and regularly following up leading to the end of the record

review. Patients that were labeled "Disconnected" were new or current patients that had not

seen a Mercy Care provider for more than 6 months. Patients that were labeled "Reconnected"

were patients that had disconnected from Mercy Care but later had at least one follow up visit

during the record review period.

ED Visits and Hospital Admission Days

ED visits and hospital admissions before and after becoming a patient at Mercy Care

were also used to assess the effectiveness of the program. The Street Medicine program

hypothesized that providing consistent medical care could decrease the number of ED visits and

hospital admissions The measures to assess effectiveness were 1) the patient's total ED visits

ever at Grady Hospital, 2) all ED visits at Grady before and after the patient's first Mercy Care

encounter leading up to September 31, 2016, 3) the total number of hospital admission days at

Grady before and after the patient's first Mercy Care encounter leading up to September 31,

2016, 4) the hospital admissions that were psychiatric admissions, and 5) the hospital

admissions that were physical health related.

Analysis

The analysis was performed using the data management and analytics software SAS 9.2.

Frequency tables and means calculations were used to calculate visit information related to

visit encounters, ED visits and hospital admissions. T-tests were used to calculate significant

differences in the before and after analyses of ED encounters and hospital admissions.

V. Results

Sample

In total, 284 patient medical record reviews were conducted. Of the 284 patients, 26

patients had to be excluded because there were no Street Medicine visits noted in the chart.

Table 1 shows the demographics for the 258 patients that were included in the medical record

review. There were 206 (79.84%) male patients and 52 (20.16%) female patients. The age range

of the sample was 19-72 years with an average age of approximately 49 years. The sample was

mostly comprised of African American/Black homeless patients. Of the 258 patients, 146

(56.59%) were African American/Black, 28 (10.85%) were White, 1 (<1%) was Hispanic/Latino,

and 83 (32.17%) were of unknown race due to lack of information provided in the medical

record.

Street Medicine Encounters

Total Number of Street Medicine Visits

Table 2 shows that 132 patients (51.16%) had only one Street Medicine visit, and 83

patients (32.17%) had 2 to 3 Street Medicine visits. There were few patients with 4 to 9 visits or

10 visits or more, 31 (12.03%) and 12 (4.66%) respectively. The average number of total street

medicine visits per patient was 2.47 visits. The highest number of Street Medicine visits came

from one patient who had 18 Street Medicine encounters.

Behavioral Health Street Medicine Visits

The Street Medicine visits were grouped and analyzed according to the type of services

that were provided in the visit. For behavioral health visits, approximately half of the patients

did not seek behavioral health services during their Street Medicine visit. However, 70 patients

(27.13%) had only one behavioral health Street Medicine encounter, and 35 patients (13.57%)

had 2 to 3 visits. Fewer patients had 4 visits or more. Each patient averaged about 0.92

behavioral health visits (range= 0-8 visits).

Primary Care Street Medicine Visits

More patients engaged in primary care Street Medicine services. There were 120

patients (46.69%) that had only one visit and 66 patients (25.68%) had 2 to 3 visits. Similar to

the behavioral health visits, fewer patients had 4 visits or more. Each patient averaged about

1.56 primary care visits (range=0-14 visits).

Clinic Encounters

Total Number of Clinic Visits

Table 3 shows that 107 patients (41.47%) did not have any clinic visits, 40 patients

(15.50%) had 2 to 3 visits, and 52 patients (20.16%) had 4 to 10 visits. Only 23 patients (8.91%)

had only one visit. Fewer patients had 11 visits or more. Each patient averaged 4.97 total clinic

visits (range=0-65 visits).

Behavioral Health Clinic Visits

The clinic visits were also grouped according to the types of services provided in the

visit. For behavioral health visits, 180 patients (69.77%) did not have any behavioral health visits

and 28 patients (10.85%) had only one visit. Fewer patients had 2 or more visits. The average

number of behavioral health visits per patient was 1.44 visits (range=0-29 visits).

Primary Care Clinic Visits

For primary care visits, 115 patients (44.57%) did not have any visits, and 43 patients

(16.67%) had at 4 to 10 visits. Only 33 patients (12.79%) had only one visit, and 37 patients

(14.34%) had 2 to 3 visits. Fewer patients had 11 or more visits during the time of the study.

The average number of primary care visits per patient was 3.52 visits (range=0-65 visits).

Case Management

As noted in Table 4, only 83 of the patients (32.17%) were accessing case management

services. The other 175 patients (67.83%) were not accessing case management services.

Street Medicine Encounter vs. Clinic Encounters

The results in Table 5 indicated that 37.21% of the Street Medicine encounters were

behavioral health encounters and 62.79% were primary care encounters. Of the clinic

encounters, 29.10% were behavioral health encounters and 70.83% were primary care

encounters.

Connection to Mercy Care

Table 6 shows that 118 (45.74%) of the patients disconnected from Mercy Care since

the initial Street Medicine encounter and were no longer receiving continuous care through

Street Medicine rounds or clinic visits. Of the patients that disconnected, 83 (70.34%)

disconnected after a Street Medicine encounter and 35 (29.66%) disconnected after a clinic

encounter. There were 49 patients (18.99%) that were already connected to Mercy Care and

were receiving continuous primary care and/or behavioral health services. Eight patients

(3.10%) reconnected to Mercy Care through Street Medicine rounds or clinic encounters and

were receiving continuous care. Half of the reconnected patients reconnected through Street

Medicine rounds as with clinic encounters. Eighty-three patients (32.17%) were new patients

that were currently receiving continuous care. A total of 140 (54.26%) patients were receiving

continuous primary and/or behavioral health services.

ED Visits

Total Number of ED Visits

Table 7 shows that a majority of the patients (37.29%) had 4 to 10 ED visits, and 26 patients (11.82%) had only one ED visit. Eighteen patients (8.18%) did not have any ED visits. Fifty patients (22.73%) had 2 to 3 visits, and 44 patients (20.04%) had 11 visits or more. The average total number of ED visits was 6.14 visits per patient (range= 0-21 visits). Approximately 38 (15%) patients did not have ED data because there were no Grady Hospital records that corresponded with their information at Mercy Care.

ED Visits Before Mercy Care

In order to assess whether or not the Street Medicine program decreased the number of patients seeking ED services, the ED visits were analyzed according to visits before the first Mercy Care encounter and after the first Mercy Care encounter. Before the initial encounter with Mercy Care, 75 patients (34.09%) did not have any ED visits. Fifty-two patients (23.64%) had 4 to 10 ED visits, 45 patients (20.45%) had 2 to 3 visits, and 38 patients (17.27%) had only one visit. Fewer patients had 11 visits or more. The average number of ED visits before the initial Mercy Care encounter was 2.82 visits (range = 0-18 visits).

ED Visits After Mercy Care

For ED visits after the initial encounter with Mercy Care, 70 patients (31.82%) did not have any ED visits, which decreased from the number of patients without ED visits before Mercy Care. There are 46 patients (20.91%) with 2 to 3 visits, which was similar to the results for patients with 4 to 10 visits. Thirty-eight patients (17.24%) had only one visit, which was the same as the number of patients with at least one ED visit before Mercy Care. There are few

patients with 11 visits or more, however the number of patients increased from the ED visits

before Mercy Care. The average number of ED visits after the initial Mercy Care encounter was

3.33 visits (range=0-21), which is higher than the average number for ED visits before Mercy

Care.

Difference in ED Visits Before and After Mercy Care

Table 8 shows the results of the paired t-test analysis to compare the difference in ED

visits before and after Mercy Care. There was no significant difference in the number of ED

visits before Mercy Care (M=2.82, SD=3.61) and after Mercy Care (M=3.33, SD=4.52);

t(219)=1.22, p=0.2235.

Hospital Admissions

Hospital Admission Days Before and After Mercy Care

There were 165 patients (75.00%) and 163 patients (74.09%) with no hospital admission

days before and after the initial Mercy Care encounter, respectively, as shown in Table 9.

Twenty patients (9.09%) had only one hospital admission day before Mercy Care, and 11

patients (5.00%) had only one hospital admission day after Mercy Care. Fifteen patients (6.82%)

had 2 to 3 days before Mercy Care, and 14 patients (6.36%) had 2 to 3 days after Mercy Care.

Seventeen patients (7.72%) had 4 to 10 days before Mercy Care, and 23 (10.44%) had 4 to 10

days after Mercy Care. Fewer patients had 11 days or more before and after Mercy Care. The

average number of admission days per patient was 0.98 days (range=0-34) before the initial

Mercy Care encounter and 1.84 days (range=0-40) after the initial Mercy Care encounter.

Approximately 38 (15%) patients did not have hospital admissions data because there were no

Grady Hospital records that corresponded with their information at Mercy Care.

Table 10 shows the results of the paired t-test analysis to compare the difference in total hospital admission days before and after the initial Mercy Care encounter. There was a significant difference in the number of hospital admission days before Mercy Care (M=0.98, SD=3.08) and after Mercy Care (M=1.84, SD=5.27); t(219)=2.03, p=0.0432.

Psychiatric Admissions Before and After Mercy Care

Hospital admission visits were also grouped according to the types of services provided in that visit. For the psychiatric admissions, 190 patients (86.36%) and 202 patients (91.82%) had no admissions before and after Mercy Care respectively as shown in Table 9. Twenty patients (9.09%) had only one psychiatric admission before Mercy Care, and 12 (5.45%) had only one psychiatric admission after Mercy Care. Fewer patients had 2 or more psychiatric admissions. The average number of psychiatric admissions was 0.23 admissions (range=0-4) before Mercy Care and 0.14 admissions (range=0-6) after Mercy Care.

Table 11 shows the results of the paired t-test analysis to compare the difference in psychiatric admissions before and after Mercy Care. There was no significant difference in the number of psychiatric admissions before Mercy Care (M=0.23, SD=0.70) and after Mercy Care (M=0.14, SD=0.58); t(219)= -1.53, p=0.1276.

Physical Health Admissions Before and After Mercy Care

For physical health admissions, 188 (85.45%) and 174 (79.09%) did not have any admissions before and after Mercy Care respectively as shown in Table 9. Twenty-nine patients (13.18%) had only one admission before Mercy Care, and 28 (12.73%) had only one admission after Mercy Care. Few patients had 2 or more admissions before and after Mercy Care. The

average number of physical health admissions was 0.16 admissions (range=0-3) before Mercy

Care and 0.35 admissions (range=0-6) after Mercy Care.

Table 12 shows the results of the paired t-test analysis to compare the difference in

physical health admissions before and after Mercy Care. There was a significant difference in

the number of physical health admissions before Mercy Care (M=0.16, SD=0.43) and after

Mercy Care (M=0.35, SD=0.86); t(219)=2.77, p=0.0060.

VI. Discussion and Conclusion

Discussion

Patient Demographics

There were 59.69% more male patients in the sample than female patients. This is not

surprising as many studies [Berry (2007); Lee et al. (2016); Byrne, Montgomery, & Fargo (2016)]

and Georgia homelessness census reports reveal that men are more likely to live unsheltered

than women. It may be that there are more shelters and housing options available for women

and families experiencing homelessness or that women may be more willing to double up with

friends or families for living arrangement. One study mentions that homeless women may be

more likely to engage in "survival sex", or exchanging sex for basic necessities, to obtain shelter

(Watson, 2011).

Most of the patients in the sample were middle-aged African American/Black men. This

finding is consistent with the Georgia homelessness census reports since 2011. Despite being a

minority population, the African American/Black community has consistently had a high, and at

times the highest, rate of homelessness in America (Jones, 2016). There are various social and

economic factors that contribute to the high rate of homelessness such as lower household

incomes, housing discrimination practices and lack of education to name a few (National Law

Center on Homelessness & Poverty, 2014).

Street Medicine Encounters vs. Clinic Encounters

The average number of total Street Medicine encounters per patient was lower than the

average number of clinic encounters. The Street Medicine team was only able to conduct their

rounds one day a week for 4 hours and have limited supplies available for patient treatment. At

the Mercy Care clinic, patients had access to more medical care, dental care and behavioral

health care services five days a week from the morning until evening. It is possible that because

the clinic provided more services and flexible times for treatment, patients accessed care at a

clinic more than during Street Medicine rounds.

More patients accessed primary care services during the clinic encounters and Street

Medicine encounters than behavioral health services. This finding was interesting considering

the fact that there was a high demand for mental health services. However, the problem with

patients seeking mental/behavioral health at Mercy Care is more complex. It is possible that

stigma surrounding mental illness and distrust of mental/behavioral health care providers may

be causing the patients to defer from accessing these services. Mercy Care also has more

primary care providers than behavioral health providers, which means there is a possibility that

the patients could be receiving behavioral health services from providers outside of Mercy

Care, if at all. There were no data collected about other sources of care and for what types of

services.

Connection to Mercy Care

The frequency table for connection to Mercy Care revealed that 54.26% of the Street

Medicine patients are connected to Mercy Care and engaging in consistent primary care and

behavioral health care services. On the other hand, 45.74% of the patients disconnected from

Mercy Care. Of the patients that disconnected, over 70% disconnected after a Street Medicine

encounter, and almost 30% disconnected after a clinic encounter. Though there were a high

number of patients that were disconnected, various factors that could have contributed to this

finding have to be considered. As mentioned in the literature review, people experiencing

homelessness face many barriers to receiving care such as transportation, wait times, stigma, affordability, lack of physical needs, and distrust of health care providers. Though Street Medicine has the potential to eliminate many of those barriers, issues with stigma and lack of attainment of physical needs may not be solved with Street Medicine alone. It is also possible that patients may be accessing other sources of medical and behavioral health care in the metro Atlanta area.

Because over half of the patients are regularly following up, Street Medicine may be actively eliminating some of these barriers to health care and keeping patients engaged in services. Street Medicine's outreach component decreases issues with transportation because health care providers bring health care to the patients where they live and sleep. It eliminates the needs for insurance and affordability because the services are provided to patients free of charge. Street Medicine improves the availability of resources like prescriptions, referrals, and information about where to seek other needed health services. Due to the many potential benefits of and limited information about Street Medicine, more research needs to be conducted to assess if there is a relationship between Street Medicine programs and an increase in regular follow-ups from people experiencing homelessness.

ED Visits

There was an average of 6.14 ED visits per patient at Grady Hospital. Though the results revealed that patients had more ED visits after their encounter with Mercy Care, there was no significant difference in ED visits before or after the encounter. The results may be due to the hours in which patients can access care through Mercy Care. Street Medicine services are only available on Wednesdays from 6pm to 10pm, and the clinic is only open five days a week for a

set number of hours. If a patient needs treatment outside the clinic's or the Street Medicine

team's hours of operation, the closet facility for emergency medical treatment is Grady

Hospital.

The results may also be due to an increase in the number of patients that are being

referred to the ED by a Mercy Care provider. If a patient needs emergency treatment that

cannot be accommodated at Mercy Care, they are usually referred to Grady Hospital for

medical treatment. Many of the patients that come to Mercy Care have not been seeking

regular health care services and are very ill. For example, patients have dangerously elevated

blood pressures, severely infected wounds that require IV antibiotics, or episodes of mental

illness that make the patient a danger to himself or herself or others. Therefore, the patients

are referred to Grady for life-saving emergency treatment.

Patients experiencing homeless can be difficult to follow up with if they move around

frequently or if the police force them to move out of their encampment, which could leave the

patients without regular access to medical care during Street Medicine rounds since the team

only goes out once a week. During these periods of time in which patients were not actively

following up with the Street Medicine team, it is possible that they could have been utilizing ED

services for regular sources of care.

More data need to be collected to assess the details of the patients' ED visits to

determine which ED visits were avoidable. The additional data can be used to more accurately

assess whether there were any changes in avoidable ED visits before and after the patient's

initial Mercy Care encounter.

Hospital Admissions

Similar to ED visits, the increases in total hospital admission days and number of physical health-related admissions may be due to the increased need for patients to have emergency care that leads to an admission, and even surgical procedures, that Mercy Care is not able to accommodate. As mentioned earlier, many patients that present to Mercy Care are severely ill and in dire need of life-saving treatment. It is also possible that, during the period of time in which the patients' were not regularly following up, or fell out of care, with the Street Medicine team, they were being admitted to the hospital for conditions that were previously being followed by a provider at Mercy Care. More data will need to be collected to assess whether the increase in hospital admission days is related to the times in which the patients fell out of care.

Though the decrease in psychiatric-related admissions is not statistically significant, it is potentially a significant achievement for the Street Medicine program. It is possible that that this finding is due to the patients experiencing homelessness seeking regular follow-ups for behavioral/mental health care. More data will need to be collected over time to further assess whether Street Medicine is able to significantly reduce the number of psychiatric-related hospital admissions for patients that are regularly following up.

Limitations

Collecting and analyzing data on homeless patients had many limitations. There were issues with random error. For example, it was difficult to collect hospital encounter data for 15% of the patients because people provided different names, dates of birth, or social security numbers. Therefore, the Mercy Care charts could not be accurately matched with the Grady Hospital charts.

It was also difficult to collect accurate demographic information about the patients based on inconsistencies in the medical records. About 32.17% of the records did not indicate the race of the patients. Therefore, the statistics for race could have been more accurately reported if the race was consistently indicated in the medical record.

All of the encounters had to be manually counted and separated into groups depending on the types of services that were accessed. Some visits may have been miscounted or miscategorized in the process. To mitigate this error, all visits were recounted to make sure that the number of visits in the chart matched the number of visits recorded.

A literature review revealed that there is not a lot of literature about Street Medicine programs. Further, there is not a lot of literature about assessing the effectiveness of Street Medicine programs. The lack of research related to assessing effectiveness made it difficult to determine what data should be collected. More studies should focus on addressing Street Medicine programs and how to assess the effectiveness of such programs.

Recommendations

Future Research

As mentioned previously, more data needs to be collected regarding the details of the ED visits and hospital admissions to determine if the Street Medicine program was effectively reducing ED visits and hospitalizations. One area that needs more analysis is the relationship between connection status and ED visits and hospitalizations. By comparing the periods of time in which the patients fell out of care with Mercy Care and Grady Hospital records, the resulting information could be used to determine if there is a relationship between ED visits and hospitalizations and connection status to Mercy Care. If the number of ED visits and

hospitalizations increased during the periods of time in which the patient was not regularly following up, then this could indicate that Street Medicine may have been useful in deterring some ED visits and hospitalizations.

Another area that needs more analysis is the number of avoidable ED visits. The details of the ED visits at Grady need to be re-examined to determine if the visit was necessary or could have been avoided. Upon separating and tallying the necessary ED visits from the avoidable ED visits, we can more accurately assess whether the Street Medicine program has been effective in reducing avoidable ED visits.

Outcome Evaluation

One of the main goals of the Street Medicine program is to reduce mortality and morbidity. However, the data that has been collected cannot be used to assess whether the Street Medicine program has accomplished this goal, and the Street Medicine team is currently not collecting any data related to morbidity or mortality. Therefore, it may be useful to conduct another outcome evaluation. The outcome evaluation would specifically be used to determine if the program has been effectively decreasing the rates of mortality and morbidity for people experiencing homeless living on the street. Upon completing the evaluation, the program will have a process for collecting and assessing mortality and morbidity data for the Street Medicine patients.

Conclusion

In conclusion, the Street Medicine program may be a promising solution for identifying and retaining people experiencing homelessness engaged in health care and decreasing the number of patients that turn to the hospital for avoidable and costly health care services. Due

to its street outreach component, the Street Medicine program eliminates many of the barriers

that homeless people face such as transportation, affordability, and access to resources (e.g.

prescriptions, referrals, information about where to access services). By eliminating these

barriers, the Street Medicine team hopes to decrease the rates of morbidity and mortality in

this vulnerable community and provide them with a stable medical home.

VII. References

Baggett, T. P., Hwang, S. W., O'Connell, J. J., Porneala, B. C., Stringfellow, E. J., Orav, E. J., …

Rigotti, N. A. (2013). Mortality among homeless adults in Boston: Shifts in causes of

death over a 15-year period. *JAMA Internal Medicine*, *173*(3), 189–195.

https://doi.org/10.1001/jamainternmed.2013.1604

Berry, B. (2007). A repeated observation approach for estimating the street homeless

population. Evaluation Review, 31(2), 166–199.

https://doi.org/10.1177/0193841X06296947

Bond, G. R., Drake, R. E., Mueser, K. T., & Latimer, E. (2001). Assertive community treatment for

people with severe mental illness: Critical ingredients and impact on patients. Disease

Management & Health Outcomes, 9(3), 141–159.

Buscher, A., Mugavero, M., Westfall, A. O., Keruly, J., Moore, R., Drainoni, M.-L., … Giordano, T.

P. (2013). The association of clinical follow-Up intervals in HIV-infected persons with

viral suppression on subsequent viral suppression. AIDS Patient Care and STDs, 27(8),

459–466. https://doi.org/10.1089/apc.2013.0105

Byrne, T., Montgomery, A. E., & Fargo, J. D. (2016). Unsheltered homelessness among veterans:

Correlates and profiles. Community Mental Health Journal, 52(2), 148–157.

https://doi.org/10.1007/s10597-015-9922-0

Georgia Department of Community Affairs. (2015, September). 2015 report on homelessness:

Georgia's 14,000. Retrieved August 9, 2016, from

https://www.dca.ga.gov/housing/specialneeds/programs/documents/HomelessnessRep

ort2015.pdf

Health Quality Ontario. (2016). Interventions to improve access to primary care for people who

      are homeless: A systematic review. Ontario Health Technology Assessment Series, 16(9),

      1–50.

Henwood, B. F., Cabassa, L. J., Craig, C. M., & Padgett, D. K. (2013). Permanent supportive

      housing: Addressing homelessness and health disparities? American Journal Of Public

      Health, 103 Suppl 2, S188–S192. https://doi.org/10.2105/AJPH.2013.301490

Howe, E. C., Buck, D. S., & Withers, J. (2009). Delivering health care on the streets: Challenges

      and opportunities for quality management. Quality Management In Health Care, 18(4),

      239–246. https://doi.org/10.1097/QMH.0b013e3181bee2d9

Hwang, S. W., & Burns, T. (2014). Health interventions for people who are homeless. The

      Lancet, 384(9953), 1541–7. https://doi.org/10.1016/S0140-6736(14)61133-8

Jones, M. M. (2016). Does race matter in addressing homelessness? A review of the literature.

      World Medical & Health Policy, 8(2), 139–156. https://doi.org/10.1002/wmh3.189

Ku, B. S., Fields, J. M., Santana, A., Wasserman, D., Borman, L., & Scott, K. C. (2014). The urban

      homeless: Super-users of the emergency department. Population Health Management,

      17(6), 366–371. https://doi.org/10.1089/pop.2013.0118

Laswell, A. (2015, October). Mery care 2015 needs assessemnt: Report of findings. Retrieved

      October 18, 2016, from

      https://www.mercyatlanta.org/2015_HCH_Needs_Assessment.pdf

Lebrun-Harris, L. A., Baggett, T. P., Jenkins, D. M., Sripipatana, A., Sharma, R., Hayashi, A. S., …

      Ngo-Metzger, Q. (2013). Health status and health care experiences among homeless

patients in federally supported health centers: Findings from the 2009 Patient Survey.

Health Services Research, 48(3), 992–1017. https://doi.org/10.1111/1475-6773.12009

Lee, C. T., Guzman, D., Ponath, C., Tieu, L., Riley, E., & Kushel, M. (2016). Residential patterns in

older homeless adults: Results of a cluster analysis. Social Science & Medicine, 153, 131–

140. https://doi.org/10.1016/j.socscimed.2016.02.004

Martens, W. (2009). Vulnerable categories of homeless patients in Western societies:

Experience serious barriers to health care access. Medicine & Law, 28(2), 221–239.

National Law Center on Homelessness & Poverty. (2014, July 3). Racial discrimination in housing

and homelessness in the united states: A report to the UN committee on the elimination

of racial discrimination. Retrieved November 7, 2016, from

https://www.nlchp.org/CERD_Housing_Report_2014.pdf

Nickasch, B., & Marnocha, S. K. (2009). Healthcare experiences of the homeless. Journal of the

American Academy of Nurse Practitioners, 21(1), 39–46.

O'Connell, J., Oppenheimer, S., Judge, D., Taube, R., Blanchfield, B., Swain, S., & Koh, H. (2010).

The boston health care for the homeless program: A public health framework. American

Journal of Public Health, 100(8), 1400–1408. https://doi.org/10.2105/AJPH.2009.173609

Oppenheimer, S. C., Nurius, P. S., & Green, S. (2016). Homelessness history impacts on health

outcomes and economic and risk behavior intermediaries: New insights from population

data. Families in Society: The Journal of Contemporary Social Services, 97(3), 230–242.

https://doi.org/10.1606/1044-3894.2016.97.21

Parker, R., & Dykema, S. (2013). The reality of homeless mobility and implications for improving

     care. Journal of Community Health, 38(4), 685–689. https://doi.org/10.1007/s10900-

     013-9664-2

Schwartz, L. M., Woloshin, S., Wasson, J. H., Renfrew, R. A., & Welch, H. G. (1999). Setting the

     revisit interval in primary care. Journal of General Internal Medicine, 14(4), 230–235.

     https://doi.org/10.1046/j.1525-1497.1999.00322.x

Watson, J. (2011). Understanding survival sex: young women, homelessness and intimate

     relationships. Journal of Youth Studies, 14(6), 639–655.

     https://doi.org/10.1080/13676261.2011.588945

Welch, H. G., Chapko, M. K., James, K. E., Schwartz, L. M., & Woloshin, S. (1999). The role of

     patients and providers in the timing of follow-up visits. Telephone care study group.

     Journal of General Internal Medicine, 14(4), 223–229.

Wen-Chieh, L., Bharel, M., Jianying, Z., O'Connell, E., & Clark, R. E. (2015). Frequent emergency

     department visits and hospitalizations among homeless people with medicaid:

     Implications for medicaid expansion. American Journal of Public Health, 105, S716–

     S722. https://doi.org/10.2105/AJPH.2015.302693

Young, M., Barrett, B., Engelhardt, M., & Moore, K. (2014). Six-month outcomes of an

     integrated assertive community treatment team serving adults with complex behavioral

     health and housing needs. Community Mental Health Journal, 50(4), 474–479.

     https://doi.org/10.1007/s10597-013-9692-5

VIII. Appendices

Figure 1. Logic Model

Goal: Use Mercy Care's Street Medicine program to assist homeless patients in the downtown Atlanta area with getting consistent primary care and mental health services
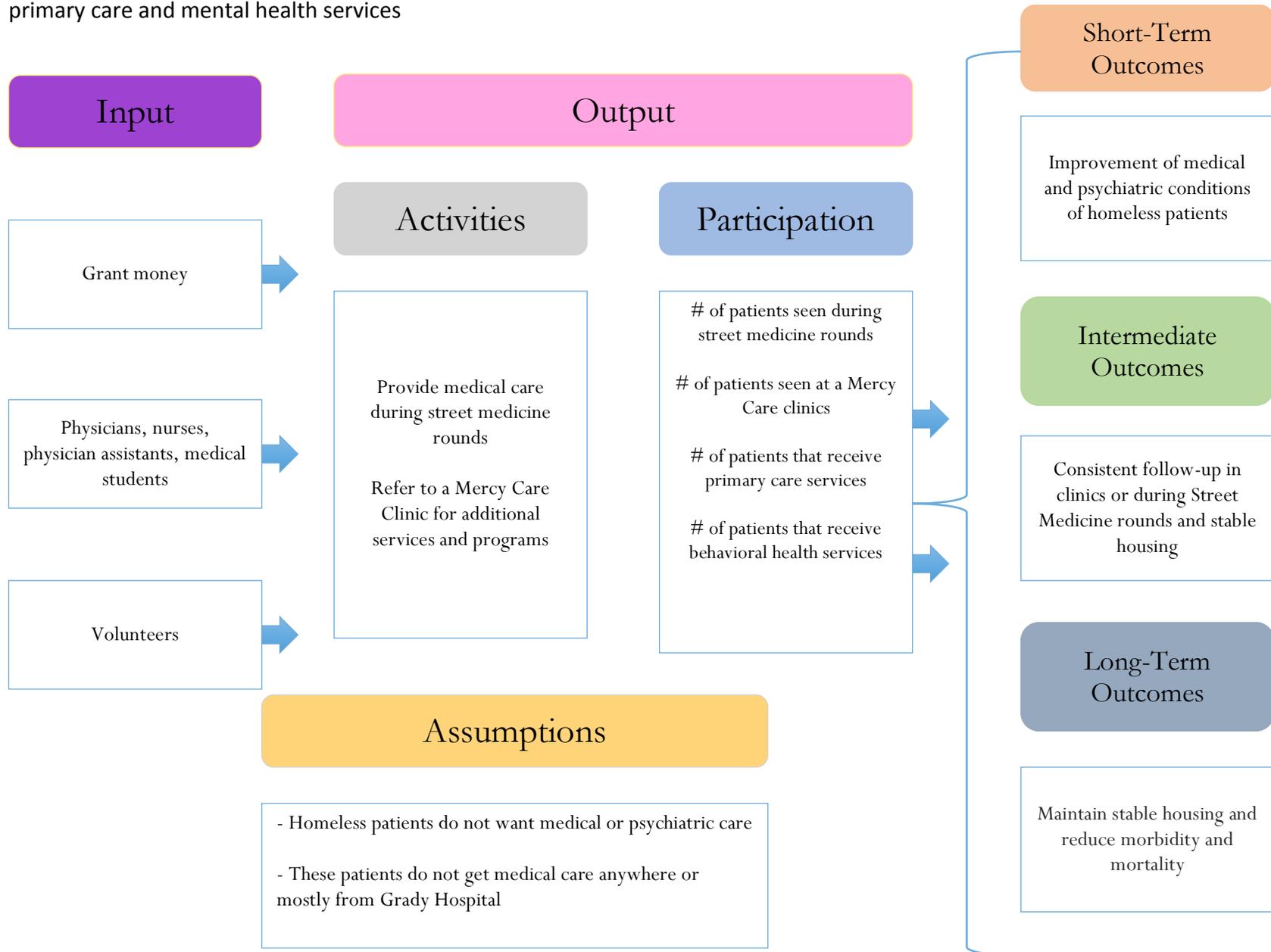
Table **Sociodemographics of the Study Population**

Variable	N (%) (N = 258)
Gender	
Female	*52 (20.16%)*
Male	*206 (79.84%)*
Age	
19 - 29	*17 (6.59%)*
30 - 39	*38 (14.72%)*
40 - 49	*68 (26.37%)*
50 - 59	*98 (37.98%)*
60 or older	*37 (14.34%)*
Race	
African American/Black	*146 (56.59%)*
Hispanic/Latino	*1 (<1%)*
White	*28 (10.85%)*
Unknown	*83 (32.17%)*

Table 2. **Street Medicine Encounters**

	Total Number of Patients with Street Medicine Visits N (%) (N = 258)	Total Number of Patients with Behavioral Health Visits N (%) (N = 258)	Total Number of Patients with Primary Care Visits N (%) (N = 257)
0 visits	0	*137 (53.10%)	*51 (19.84%)
1 visit	132 (51.16%)	70 (27.13%)	120 (46.69%)
2 -3 visits	83 (32.17%)	35 (13.57%)	66 (25.68%)
4 visits or more	43 (16.69%)	16 (6.20%)	20 (7.79%)

* Note: The patients with no behavioral health visits only had primary care visits, and the patients with no primary care visits only had behavioral health visits.

Table 3. **Clinic Encounters**

	Total Number of Patients with Clinic Visits N (%) (N = 258)	Total Number of Patients with Behavioral Health Visits N (%) (N = 258)	Total Number of Patients with Primary Care Visits N (%) (N = 258)
0 visits	107 (41.47%)	*180 (69.77%)	*115 (44.57%)
1 visit	23 (8.91%)	28 (10.85%)	33 (12.79%)
2 – 3 visits	40 (15.50%)	19 (7.37%)	37 (14.34%)
4 – 10 visits	52 (20.16%)	20 (7.76%)	43 (16.67%)
11 visits or more	36 (14.02%)	11 (4.28%)	30 (11.65%)

* Note: The patients with no behavioral health visits only had primary care visits, and the patients with no primary care visits only had behavioral health visits.

Table 4. **Case Management**

	N (%) (N = 258)
Yes	83 (32.17%)
No	175 (67.83%)

Table 5. **Street Medicine Encounters vs. Clinic Encounters**

	Behavioral Health Visits	*Primary Care Visits*
Street Medicine Encounters *N (%)* *(N = 637)*	*237 (37.21%)*	*400 (62.79%)*
Clinic Encounters *N (%)* *(N = 1282)*	*373 (29.10%)*	*908 (70.83%)*

Table 6. Patient Connection Status

	N (%) N = 258
Already Connected	49 (18.99%)
**Started*	83 (32.17%)
***Disconnected*	118 (45.74%)
****Reconnected*	8 (3.10%)
	N (%) N = 118
Disconnected after Street Medicine	83 (70.34%)
Disconnected after Clinic Visit	35 (29.66%)
	N (%) N = 8
Reconnected after Street Medicine	4 (50%)
Reconnected after Clinic Visit	4 (50%)

Notes:
* Patients that were labeled "Started" were new patients at the time of their first Street Medicine encounter and were regularly following up.
**Patients that were labeled "Already Connected" were already being seen at a Mercy Care clinic location at the time of the their first Street Medicine encounter and regularly following up.
***Patients that were labeled "Disconnected" were new or current patients that discontinued seeing a Mercy Care provider for more than 6 months.
****Patients that were labeled "Reconnected" were patients that had disconnected from Mercy Care but later re-engaged in regular follow up visits.

Table 7. ED Visits

	Total Number of Patients with ED Visits N (%) (N = 220)	Total Number of Patients with ED Visits Before Mercy Care N (%) (N =220)	Total Number of Patients with ED Visits After Mercy Care N (%) (N = 220)
0 visits	18 (8.18%)	75 (34.09%)	70 (31.82%)
1 visit	26 (11.82%)	38 (17.27%)	38 (17.24%)
2 – 3 visits	50 (22.73%)	45 (20.45%)	46 (20.91%)
4 – 10 visits	82 (37.29%)	52 (23.64%)	46 (20.91%)
11 visits or more	44 (20.04%)	10 (4.54%)	20 (9.07%)

Table 8. **Paired Sample T Test for ED Visits Before and After Mercy Care**

			Paired Differences						*Sig. (2-tailed)*
	N	*Mean*	*Std. Dev.*	*Std. Err.*	*95% CL Lower*	*95% CL Upper*	*t*	*df*	
Pair After - Before	*220*	*0.5091*	*6.1855*	*0.4170*	*-0.3128*	*1.3310*	*1.22*	*219*	*0.2235*

Table 9. **Hospital Admissions Before and After Mercy Care**

	Before Mercy Care N (%) (N = 220)	After Mercy Care N (%) (N = 220)
Total Number of Patients with Hospital Admission Days		
No days	*165 (75.00%)*	*163 (74.09%)*
1 day	*20 (9.09%)*	*11 (5.00%)*
2 -3 days	*15 (6.82%)*	*14 (6.36%)*
4 – 10 days	*17 (7.72%)*	*23 (10.44%)*
11 days or more	*3 (1.35%)*	*9 (14.91%)*
Total Number of Patients with Psychiatric Admission Visits		
No visits	*190 (86.36%)*	*202 (91.82%)*
1 visit	*20 (9.09%)*	*12 (5.45%)*
2 visits	*4 (1.82%)*	*3 (1.36%)*
3 visits or more	*6 (2.73%)*	*3 (1.36%)*
Total Number of Patients with Physical Health Admission Visits		
No visits	*188 (85.45%)*	*174 (79.09%)*
1 visit	*29 (13.18%)*	*28 (12.73%)*
2 visits	*2 (<1%)*	*12 (5.45%)*
3 visits or more	*1 (<1%)*	*6 (2.72%)*

Table 10. **Paired Sample T Test for Total Hospital Admission Days Before and After Mercy Care**

	Paired Differences								Sig. (2-tailed)
	N	Mean	Std. Dev.	Std. Err.	95% CL Lower	95% CL Upper	t	df	
Pair After - Before	220	0.8591	6.2660	0.4225	0.0265	1.6917	2.03	219	0.0432

Table 11. **Paired Sample T Test for Psychiatric Admissions Before and After Mercy Care**

			Paired Differences						*Sig. (2-tailed)*
	N	*Mean*	*Std. Dev.*	*Std. Err.*	*95% CL Lower*	*95% CL Upper*	*t*	*df*	
Pair After - Before	220	-0.0909	0.8815	0.0594	-0.2080	0.0262	-1.53	219	0.1276

Table 12. **Paired Sample T Test for Physical Health Admissions Before and After Mercy Care**

			Paired Differences						*Sig. (2-tailed)*
	N	*Mean*	*Std. Dev.*	*Std. Err.*	*95% CL Lower*	*95% CL Upper*	*t*	*df*	
Pair After - Before	*220*	*0.1864*	*0.9962*	*0.0672*	*0.0540*	*0.3187*	*2.77*	*219*	*0.0060*