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Sociodemographic, Health, Health-Related, Health Risk, Psychosocial, and Treatment-Related Characteristics Associated with Retention Among Community Mental Health Clients in an Integrated Health Program

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SOCIODEMOGRAPHIC, HEALTH, HEALTH-RELATED, HEALTH RISK,
PSYCHOSOCIAL, AND TREATMENT-RELATED CHARACTERISTICS ASSOCIATED
WITH RETENTION AMONG COMMUNITY MENTAL HEALTH CLIENTS IN AN
INTEGRATED HEALTH PROGRAM

A Thesis

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in

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ABSTRACT

Individuals with serious mental illness (SMI) have higher rates cardiometabolic conditions than the general population, which put them at increased risk for early mortality. Treatment retention is especially important as it may prevent worsening of mental and physical health symptoms and lower such risks. Models of integrated primary and behavioral health care (PBHC) are promising for treating co-morbid mental and physical health conditions common to individuals with SMI. Previous research identified that individuals with SMI drop out of care at higher rates than other individuals with mental illness. Past studies on treatment retention with this population have been qualitative and small in scope. This longitudinal study examines correlates of treatment retention, including sociodemographic, health, psychosocial, and treatment-related characteristics among individuals with SMI in an integrated PBHC program in a community mental health setting. Variables significantly associated with 12-month treatment retention included access to transportation, no illicit drug use, and 6-month treatment retention. Several variables identified as important correlates of retention in previous studies were not found to be significantly associated with 12-month retention. Directions for future research and implications for social work are discussed.

CHAPTER 1: INTRODUCTION

This study examined correlates of treatment retention and dropout among individuals with serious mental illness (SMI). This chapter describes treatment of persons with SMI and specific health disparities this population faces. The issue of treatment retention is further explored in relation to integrated primary and behavioral health care (PBHC) services. The biopsychosocial model is introduced as a theoretical framework that is relevant to understanding treatment of individuals with SMI and the importance of treatment retention. Finally, the relevance of this study to the field of social work and social work practice is discussed.

Problem Statement

It is well understood that individuals with SMI have a greater likelihood of developing cardiometabolic conditions than the general population, which put them at risk for early death (Colton & Manderscheid, 2006; De Hert et al., 2011). Disengagement from treatment can put individuals with SMI at higher risk for worsening mental health symptoms, increased hospitalizations, and higher rates of suicide (Kreyenbuhl, Nossel, & Dixon, 2009). In addition, studies have found that re-engagement in mental and behavioral health care can buffer the risk of early death (Davis et al., 2012). The purpose of this study is to explore correlates of retention among individuals with SMI receiving integrated PBHC services in a community mental health (CMH) setting.

Importance of the Problem

Nationally representative survey data show that there are 9.8 million adults with SMI in the United States (Substance Abuse and Mental Health Services Administration [SAMHSA], 2015a). In a landmark report published a decade ago, Parks, Svendsen, Singer, and Foti (2006) showed that individuals with SMI die, on average, 25 years younger than the general population.

Parks, Radke, and Mazade (2008) report that although suicide may contribute to increased mortality rates among those with SMI, the vast majority of the increase is due to untreated, yet preventable chronic diseases and medical conditions. De Hert et al. (2011) suggest that “modifiable risk factors” related to health and lifestyle contribute to this as well (p. 58). These factors include higher rates of obesity, diabetes, hypertension, and smoking than the general population (De Hert et al., 2011). The chronic health problems experienced by persons with SMI can impact family members who may struggle to care for their loved ones and pay for mounting health expenses. Such health disparities have enormous financial costs. A study of Medicaid claims from individuals with SMI found that nearly two thirds had one or more chronic health conditions and individuals with comorbid conditions were among the most costly to treat (Jones et al., 2004; Kronick, Bella, & Gilmer, 2009). Models of integrated care, which involve coordination of behavioral and primary health care services, have the potential to reduce the high costs of treating individuals with SMI. Woltmann et al. (2012) found that integrated PBHC treatment significantly improved quality of life and depressive symptoms for individuals with SMI, and did not differ in cost from usual care.

Scope of the Problem

SMI is a category of mental illness that leads to significant impairment in one’s daily life (Gerrity, Zoller, Pinson, Pettinari, & King, 2014). SMI includes mood disorders such as major depression and bipolar disorder and thought disorders such as schizophrenia (Gerrity et al., 2014). SMI affects around one fifth of all adults with mental disorders in the United States (Gerrity et al., 2014). Individuals with SMI report higher rates of health-risk factors than the general population such as smoking, poor diet, lack of exercise, and substance abuse (Parks et

al., 2006). Also, medications typically prescribed to individuals with SMI can increase risk for developing cardiometabolic conditions (De Hert et al., 2011).

Many individuals with SMI lack access to primary health care services and rely on emergency services to meet their physical health needs (Miller, Druss, Dombrowski, & Rosenheck, 2003). However, the research suggests that those who do obtain primary health care services may receive care that is subpar (Miller et al., 2003). For example, medical and mental health practitioners may neither be screening and treating patients for, nor adequately educating patients about chronic cardiometabolic conditions (De Hert et al., 2011). Individuals with SMI often report that their physical and mental health care services are not well coordinated (Miller et al., 2003). Further, health care providers may not be comfortable treating comorbid conditions (Druss & Walker, 2011).

Keeping individuals with SMI engaged in treatment remains of utmost importance, as those who prematurely drop out of treatment are at increased risk of experiencing debilitating mental health symptoms (Kreyenbuhl et al., 2009). Treatment dropout rates for individuals with SMI are higher than the rates of individuals with other mental health diagnoses; however, reasons why individuals with SMI drop out of treatment are not clearly understood (Kreyenbuhl et al., 2009; Smith, Easter, Pollock, Pope, & Wisdomet, 2013). Lester, Tritter, & Sorohan (2005) found that individuals with SMI cited worsening symptoms as a main contributor to treatment dropout; whereas providers believed that stigma and lack of awareness of symptoms were the most relevant contributing factors (Smith et al., 2013). Providers and patients agree that communication is vital for building rapport and for ensuring satisfaction with treatment (Kreyenbuhl et al., 2009). Although treatment dropout within Veterans Affairs (VA; Abraham et

al., 2013) and CMH centers (Olfson et al., 2009) has been examined, correlates of treatment dropout in integrated PBHC programs have not been explored.

Theoretical Significance

This study is informed by the biopsychosocial (BPS) model, which frames an understanding of the complex interrelationships among biological, psychological, and social factors relevant to individuals with SMI. The BPS model was developed by George Engel in 1977 as a challenge to the predominant medical model at the time, which did not consider the influence of biological, psychological, and social factors on illness (Engel, 1977). The BPS model is of great importance to social workers practicing in health-related settings, and is emphasized as an essential framework for understanding clients and their unique needs (National Association of Social Work; NASW, 2016). This study considers individuals' physical health, mental health, and other influential psychosocial factors as they relate to treatment dropout. The BPS model and its holistic understanding of illness are especially relevant to the treatment experiences of persons with SMI.

Contributions to the Field of Social Work

The NASW Code of Ethics (2008) advises social workers to be lifelong learners about the populations they serve, as well as to inform organizations and colleagues about methods that best meet the needs of clients. The Code of Ethics also emphasizes improving clients' well being, and aiding and advocating for vulnerable groups, in particular (NASW, 2008). As individuals with SMI are at increased risk for adverse health conditions and early death, they are a vulnerable group that deserves and could benefit from advocacy from social workers.

NASW (n.d.) reports that social workers provide the majority of mental health services as compared to other providers (e.g., psychologists, psychiatrists, and psychiatric nurses) in a wide

variety of practice settings. NASW (2016) specifically states that social workers in healthcare settings are obligated to address health disparities and advocate for disadvantaged and marginalized clients. This study aims to increase knowledge about an understudied topic, thus, the results may help practitioners who work with individuals with SMI better understand potential predictors of treatment dropout in CMH settings.

It is clear that treatment retention is especially important for this vulnerable population, and may help reduce mortality and morbidity (Davis et al., 2012). Social workers, who are overrepresented in mental health settings, are vital to the delivery of mental health services and ideally positioned to advocate for this vulnerable population (NASW, 2016; NASW, n.d.). Developing further knowledge on the topic of treatment dropout is important as it is anticipated that organizations will increasingly shift to models of integrated care (Druss & Walker, 2011). This study is the first known study to examine correlates of treatment retention in an integrated PBHC program in a CMH setting.

CHAPTER 2: REVIEW OF THE LITERATURE

This chapter reviews the current knowledge on contributors to treatment dropout in health and mental health care for individuals with SMI. Prevalence of SMI is discussed, as well as increased health risks in this population. In addition, the importance of integrated PBHC in CMH settings is considered, as well as treatment retention and reengagement in such programs. This chapter concludes with a summary of major findings and the implications regarding the state of the knowledge about the treatment experiences of persons with SMI in CMH settings.

Background on Serious Mental Illness

SMI is a category that includes mental illness that significantly impairs one's functioning and ability to complete everyday activities (Gerrity et al., 2014). This can include mood disorders such as major depression and bipolar disorder, as well as thought disorders such as schizophrenia. SMI occurs in approximately one fifth of adults with mental illness in the United States (Gerrity et al., 2014). The 2014 National Survey on Drug Use and Health (NSDUH) found that 9.8 million adults had some type of SMI in the past year, which was similar to findings from previous years (SAMHSA, 2015a). Prevalence rates for past year SMI were slightly higher for females than for males (5% and 3.1% respectively, SAMHSA, 2015b). Prevalence rates were higher for Whites (4.4%) than for all other ethnicities including Hispanic/Latinos (3.5%), Blacks (3.1%), and Asians (2.4%, SAMHSA, 2015b). Prevalence rates were also higher for individuals without health insurance (5.2%) than for those with health insurance (3.9%, SAMHSA, 2015b). Individuals whose household income was below the federal poverty level had almost twice the rate of SMI (7%) than those whose household income was above the federal poverty level (3.6%, SAMHSA, 2015b).

SMI includes both mood (e.g., major depression, bipolar disorder) and thought disorders (e.g., schizophrenia, bipolar disorder, schizoaffective disorder). Schizophrenia is a disorder that has a typical onset during late adolescence or young adulthood, where individuals slowly develop more symptoms and impairment over time (American Psychiatric Association [APA], 2013). Men typically have an age of onset that is three to five years earlier than women (Canuso & Pandina, 2007). Schizophrenia is characterized by positive symptoms (i.e., delusions and hallucinations), negative symptoms (i.e., flat affect and catatonic behavior), and disorganized symptoms (i.e., disorganized speech and motor movement) that lead to functional impairment (APA, 2013). Women with schizophrenia report slightly better psychosocial functioning than men (Canuso & Pandina, 2007).

For a diagnosis of schizophrenia, at least two symptoms must occur for most of the time for at least a one-month period, while some disturbance caused by symptoms must last for six or more months (APA, 2013). Individuals with schizophrenia may go through periods of time where symptoms are less pronounced and they may lack awareness about the extent of their impairment (APA, 2013). Lifetime prevalence rates of schizophrenia range from .3 to .7% (APA, 2013). Schizophrenia has a high rate of comorbidity with tobacco use disorder (APA, 2013).

A diagnosis of schizoaffective disorder, another SMI, is given when a mood episode of major depression or mania occurs in the context of symptoms of schizophrenia (APA, 2013). Delusions or hallucinations must be present for at least two weeks without the additional mood episode during the illness, but the mood episode symptoms must exist for the majority of the time concurrent with the schizophrenia symptoms (APA, 2013). Lifetime prevalence of schizoaffective disorder is about .3%, and the disorder occurs more frequently in women (APA, 2013).

Bipolar I Disorder (BPDI) and Bipolar II disorder (BPDII) are similar, but the main difference is that individuals diagnosed with BPDI must have experienced a manic episode, which is characterized by an elevated mood, increased energy, and more goal-directed activity for the majority of time, for at least a week (APA, 2013). Symptoms include increased self-esteem, less need for sleep, racing thoughts, increased talkativeness, difficulty focusing, and participation in risky behaviors (APA, 2013). The disorder causes impairment in everyday life and may require hospitalization. Individuals with BPDI or BPDII may also have major depressive episodes, but this is not necessary for a diagnosis (APA, 2013). A major depressive episode consists of the presence of at least five symptoms for at least two weeks and a change in functioning. These symptoms include either depressed mood for the majority of every day, or loss of interest or pleasure in things that used to be pleasurable, nearly every day (APA, 2013). Other symptoms that may occur include changes in appetite, weight loss or gain, difficulty sleeping, fatigue, feeling worthless, and trouble concentrating (APA, 2013). The 12-month prevalence of BPDI is about .6% (APA, 2013). Co-morbid anxiety disorders and substance use disorders are common with BPDI, and about half of such individuals have a co-occurring alcohol use disorder (APA, 2013). BPDII is similar, but the criteria for a diagnosis include meeting criteria for a previous hypomanic episode and major depressive episode. A hypomanic episode is similar to a manic episode but symptoms last at least four days, and the degree of impairment is not as marked (APA, 2013). The 12-month prevalence of BPDII in the United States is slightly higher than that of BPDI, at .8% (APA, 2013). Over three fourths of individuals with a BPDII diagnosis have a co-occurring anxiety disorder, and also are at increased risk for substance use disorders and eating disorders (APA, 2013).

Major depressive disorder (MDD) is characterized by the symptoms of a major depressive episode that lead to distress or impairment in everyday life (APA, 2013). It is important for a clinician to distinguish MDD from the normal grieving process (APA, 2013). SAMHSA (2015a) found that 6.6% of adults in the United States had a major depressive episode in the previous year, and two thirds of those individuals reported severe impairment related to difficulty functioning at home or work and difficulty with socializing (SAMHSA, 2015a). Females experience MDD at higher rates than their male counterparts, and young adults have the highest rates of MDD of any age group (APA, 2013).

As compared to the general population, individuals with SMI tend to have smaller social networks and rely more on family and mental health service providers for social support (Townley, Miller, & Kloos, 2013). Meaningful integration into the community and social support from family and friends are beneficial in the recovery process (Townley et al., 2013). Also, individuals with SMI who live with a spouse or child report higher levels of social interaction (Eklund & Hansson, 2007). Individuals with SMI who report greater numbers of unhealthy days report lower levels of perceived social connectedness and perceived functioning (Parks, Radke, & Mazade, 2008). Self-rated health and quality of life among individuals with SMI have been associated with social integration (Eklund & Hansson, 2007).

Health Risks in the SMI Population & Contributing Factors

Increased Mortality and Morbidity

In a landmark study of individuals receiving public mental health services in eight states, Colton and Manderscheid (2006) found that clients had an elevated risk of death, as compared to the general population. Findings indicated that this risk was constant across 11 age groups, and that the average number of years of life lost to clients ranged from 13-30 (Colton &

Manderscheid, 2006). Further, results showed that clients with SMI died 1-10 years younger than other clients receiving services at public facilities (Colton & Manderscheid, 2006). However, the causes of death of these latter individuals were similar to those of the general public, with the most common being heart disease and cancer (Colton & Manderscheid, 2006). Parks et al. (2006) reported that individuals with SMI die 25 years younger than the general population. While part of this increased mortality is attributable to suicide and injury, most of it is due to modifiable risk factors and health conditions that are treatable (viz., smoking, substance abuse, poor nutrition, and lack of exercise; Parks et al., 2006). Compared to the general population, individuals with SMI are more than three times as likely to smoke cigarettes (Parks et al., 2006). Alcohol and substance use disorders also are very prevalent in this population, with studies reporting a 40 to 70% rate of co-occurrence with SMI (Parks et al., 2006). Hartz et al. (2014) found that individuals with severe psychotic disorders are more likely to be heavy users of marijuana, and are more likely to use other recreational drugs than the general population. Individuals with schizophrenia also report less engagement in health maintenance behaviors (e.g., medical screenings and exercise) than the general population (APA, 2013).

Improper or inadequate care may also contribute to increased risk of early mortality. A meta-analysis of 17 outcome studies by Mitchell and Lord (2010) found evidence that cardiac care provided to individuals with SMI was of lower quality and that poor care was related to increased mortality in this population. An additional meta-analysis of 28 studies found that individuals with SMI received fewer assessments and less treatment and education about cardiovascular disease and diabetes than did individuals without SMI with the same medical conditions (Scott, Platania-Phung, & Happell, 2012). It was also noted that fewer disparities

were seen in research at The VA, which has a system of integrated mental and physical health care (Scott et al., 2012).

Comorbidity

A literature review examining comorbidity of medical and mental health problems showed that comorbidity was common, with the majority of individuals with mental disorders also reporting medical conditions (Druss & Walker, 2011). A review of Medicaid claims of 147 individuals with SMI diagnoses found that 7% had one chronic health condition and 50% had two or more chronic health conditions (Jones et al., 2004). Druss and Walker (2011) identified several common risk factors for developing both mental and physical health conditions, including childhood adversity, stress, and low socioeconomic status. In addition, mental and medical disorders may increase risk for one another. For example, physical symptoms may exacerbate mental health symptoms whereas mental health symptoms can worsen physical symptoms (e.g., stress can weaken the immune system; Druss & Walker, 2011). Also, medications for certain mental disorders may have side effects that affect physical health and vice versa. Comorbid mental and physical health conditions may impact one's quality of life and ability to take care of oneself (Druss & Walker, 2011).

Individuals with SMI commonly experience other chronic health problems. Baughman et al. (2016) compared 203 active clients with SMI at a CMH center to a matched sample of individuals without SMI, and found a greater prevalence of seven out of nine identified chronic health conditions in the SMI group. This was especially true for chronic pain, which was twice as common among individuals with SMI (Baughman et al., 2016). A study of diagnostic and pharmacy data for Medicaid recipients found that 60% of individuals with cardiovascular disease also had psychiatric illnesses (Kronick et al., 2009). Lemieux, Richards, Hunter, & Kasofsky

(2015) found that among a sample of 125 individuals with SMI receiving integrated care in a CMH setting, women had notably more comorbid medical conditions than men. There was also a trend for Blacks to have more comorbid medical conditions than Whites (Lemieux et al., 2015). Thus, race and gender may moderate the increased health risks experienced by those with SMI.

Cardiometabolic Conditions

Previous research has shown that individuals with SMI are at higher risk than the general public for medical problems. For example, cardiometabolic conditions are important to consider among individuals with SMI, as they increase individuals' risk of developing diabetes, cardiovascular disease, stroke, and other chronic conditions, which have the potential to decrease quality of life and increase mortality (De Hert et al., 2011). Lifestyle factors among individuals with SMI (e.g., poor diet and lack of adequate exercise), mental health symptoms, and psychotropic medications may exacerbate the risk of developing cardiometabolic conditions (De Hert et al., 2011). Screening for cardiometabolic risk factors is inadequate among individuals with SMI, so such conditions may go untreated (De Hert et al., 2011). Parks et al. (2006) suggest that in order to reduce risk in this population, early detection is important. Thus, adequate screening, treatment, and education about cardiometabolic conditions are essential (Parks et al., 2006).

De Hert et al. (2011) describe five risk factors for developing cardiometabolic conditions among individuals with SMI; these are obesity, high triglyceride (TRI) levels, reduced high-density lipoprotein (HDL) levels, hypertension, and high blood sugar. Medical recommendations for individuals with SMI involve the monitoring of physical health (Parks et al., 2006; 2008). Such monitoring is especially important for individuals who take second-generation antipsychotic medications, which may increase their risk of cardiometabolic conditions (Correll

et al., 2010; Parks et al., 2006). Tracking of mechanical (e.g., body mass index [BMI], diastolic blood pressure [BP], systolic BP) and laboratory health indicators (e.g., blood glucose, HDL, low-density lipoprotein [LDL], TRI, and total cholesterol) provides an efficient means to assess such risk factors and individuals' physical health (Parks et al., 2006; 2008). Monitoring of BMI is used to determine whether individuals meet criteria for obesity, which is a risk factor for Type 2 diabetes, heart disease, and hypertension (Parks et al., 2008). BP is important to monitor, as high BP puts individuals at increased risk of heart disease, stroke, and hypertension (Parks et al., 2008). Increasing HDL levels is associated with lower weight and overall cholesterol levels, while decreasing TRI and LDL levels is associated with lower risk of diabetes, heart disease, and obesity (Parks et al., 2008). In addition, it is recommended that practitioners collect information on patients' personal history of cardiometabolic conditions (Parks et al., 2006; 2008).

A nationally representative survey of over 6000 individuals with either schizophrenia or bipolar disorder found that participants showed numerous elevated cardiometabolic risk factors, including high BP and being overweight (Correll et al., 2010). In addition, notable proportions of the sample reported that their conditions were untreated at the time of the study (Correll et al., 2010). Gleason et al. (2014) studied gender differences in a sample of 311 adults in an integrated PBHC setting and found that men with SMI had higher rates of at-risk diastolic BP and TRI while women with SMI had higher rates of at-risk waist circumference and BMI. Men and women did not show notable differences in cholesterol, systolic BP, or blood glucose (Gleason et al., 2014). The authors suggest that unique risk factors put women with SMI at higher risk for medical conditions related to obesity such as diabetes; and that obesity could exacerbate mental health symptoms (Gleason et al., 2014). The unique risk factors for men with SMI put them at higher risk for other medical conditions, namely heart disease and stroke (Gleason et al., 2014).

Parks et al. (2006) also noted that psychotropic medications taken by some individuals (e.g., antipsychotics) may directly contribute to conditions such as obesity, diabetes, and metabolic syndrome.

Within the category of SMI, different illnesses have been associated with different cardiometabolic risks. For example, individuals with schizophrenia are more likely than the general population to experience weight gain, diabetes, heart disease, metabolic syndrome, and pulmonary disease (APA, 2013). Some of the increased risk among individuals with schizophrenia may be explained by the high rates of co-occurring tobacco use disorders (APA, 2013). With schizoaffective disorder, rates of various medical conditions are also higher than those of the general population (APA, 2013). Chouinard et al. (2016) compared 262 patients with schizophrenia, schizoaffective disorder, and bipolar disorder; and these authors found that individuals with schizoaffective disorder or a history of a major depressive episode had the highest rates of overweight and obesity, after controlling for age, sex, and ethnicity. With BPDI, rates of metabolic syndrome are higher than those in the general population (APA, 2013). In general the increased risk experienced by persons with SMI is an important area for intervention, but specific risk factors vary slightly with each disorder.

Integrated PBHC

Background of Integrated Treatment

Integrated PBHC treatment involves a wide range of strategies for providing coordinated health services to clients (Gerrity et al., 2014). There are several models of integrated PBHC that exist on a continuum from coordinated to full integration (Heath, Wise, Romero, & Reynolds, 2013). Behavioral and primary health care may be provided within the same agency, services

may be co-located in an existing behavioral or physical health agency, or a referral system may exist between organizations (Druss & Walker, 2011).

With fully integrated PBHC, one organization has the capacity to provide all needed mental and physical health services (Heath et al., 2013). One example of a fully integrated organization is the VA (Druss & Walker, 2011). In fully integrated agencies, clients can get both mental and physical health care needs met within one facility, medical records can be integrated in such systems, and staff are dedicated to simultaneously treating both mental and physical health (Druss & Walker, 2011). Co-located care involves embedding mental health services in a primary care setting; or, conversely, providing physical health care services within a mental health setting (Druss & Walker, 2011). Existing organizations, such as CMH centers, can partner with others to provide additional services (e.g., primary care services) on site (Druss & Walker, 2011). This model of co-located care allows for clients to access needed services in one location without substantively changing the organizational infrastructure of partnering agencies, which may be a more cost-effective way to provide PBHC services when full integration is not feasible (Druss & Walker, 2011). The final model of integrated PBHC is coordinated care, in which some communication occurs between providers, but physical and mental health care systems remain separate (Heath et al., 2013). Coordinated care may involve a streamlined referral process between providers and often requires a care manager on staff to facilitate referrals, help clients access outside care, and follow up with clients and other care providers (Druss & Walker, 2011). The coordinated care model may be feasible for smaller organizations that do not have the funding or space to provide fully integrated services or co-located services (Heath et al., 2013).

Integrated PBHC treatment is important because comorbid mental and physical health conditions are common, occurring in around 17% of the general population in a given year

(Druss & Walker, 2011). This strong relationship between mental and physical health conditions provides support for integrated PBHC approaches that simultaneously address both types of conditions. In addition, the idea that many of the risk factors associated with increased morbidity among those with SMI are treatable (e.g., smoking, inadequate physical activity, and poor nutrition) supports current efforts to target this population for integrated treatment (Druss & Walker, 2011; Parks et al., 2008).

Medicaid is a resource for health care coverage for low-income individuals, and its policies emphasize the importance of maximizing both health outcomes and cost effectiveness of services (Gerrity et al., 2014). Medicaid policy promotes integrated PBHC treatment as an effective approach for addressing overlapping physical and mental illness in beneficiaries. Comorbid mental and physical health conditions are both highly prevalent and costly among Medicaid recipients (Kronick et al., 2009). Models of integrated care have the potential to improve health outcomes and provide more cost effective health care than current services available to individuals with SMI. Collaborative chronic care models (CCMs) articulate changes that can be made in the primary care setting to improve treatment of patients with chronic conditions such as providing linkages to community resources, prioritizing chronic care within organizations, supporting patients' ability to self-manage chronic illness, separating treatment of acute problems from chronic condition management, promoting evidenced-based practice, and using medical records effectively (Bodenheimer, Wagner, & Grumbach, 2002). In a meta-analysis of collaborative CCMs of integrated PBHC treatment, Woltmann et al. (2012) found that most did not differ in cost from usual care. In fact, CCMs were associated with greater reductions in depressive symptoms, increased mental and physical quality of life, and greater

social role functioning in individuals with SMI, as compared to usual care (Woltmann et al., 2012).

Considerations for Integrated PBHC

Individuals with SMI show different patterns of primary care usage than the general population. For example, research has found that those with SMI are less likely to access preventative health care (Druss & Walker, 2011). A review of Veteran's Health Administration data describing medical services used by 175,653 patients in one year showed that patients with psychiatric diagnoses utilized fewer medical services than those without psychiatric diagnoses, and utilization rates were even lower for patients with SMI (Cradock-O'Leary et al., 2002). A smaller study of 59 patients with SMI at a CMH center found that a large proportion lacked primary care or relied on emergency care on a regular basis (Miller et al., 2003). For those who did access primary care, patients reported a lack of care coordination (Miller et al., 2003). For example, almost half (45%) of respondents reported that their mental health providers did not discuss medical issues with them, and over one third (39%) stated that primary care providers did not discuss mental health issues with them (Miller et al., 2003). Parks et al. (2006) note that in order for integrated PBHC approaches to be effective, such communication issues need to be addressed because collaboration among medical and mental health providers is necessary for optimal care.

Although integrated PBHC models offer convenience to patients with comorbid conditions, it is important to ensure that patients feel comfortable and are willing to access such services where offered. Some symptoms of mental illness, such as lack of motivation and fearfulness, may influence whether individuals with SMI are willing to obtain care in a traditional primary health care setting (Druss & Walker, 2011). Research has found conflicting

evidence about whether individuals with SMI trust their health care providers (Druss & Walker, 2011; Miller et al., 2003). Druss and Walker (2011) described how individuals with SMI may not trust primary health care providers, which impacts their willingness to obtain PBHC in a primary care setting. Parks et al. (2006) noted that paranoid ideation, which is experienced by some individuals with SMI, might lead to fearfulness surrounding care. Other researchers have found the opposite to be true. For example, Miller et al. (2003) reported that respondents with SMI did, in fact, indicate high levels of trust for medical providers. The authors suggest that the problem is not that individuals with SMI are unwilling to obtain medical care, but that the quality of services they receive is often inadequate (Miller et al., 2003). Physicians who specialize in psychiatry may not be comfortable treating physical health conditions; and, conversely, primary care doctors may not be comfortable treating mental disorders (Druss & Walker, 2011). The latter situation is evidenced by frequent under diagnosing of depression in primary care (Druss & Walker, 2011). Further, some individuals with SMI may have disorganized thinking, which makes it difficult for them to follow the medical recommendations of multiple providers (Gold, Kilbourne, & Valenstein, 2008).

Integrated PBHC services vary in how they are implemented, but generally have been found to be cost effective (Druss & Walker, 2011). Individuals with SMI are more likely to rely on emergency services, as compared with the general population (Gerrity et al., 2014); thus, cost savings from these programs are associated with decreased reliance on emergency services and increased utilization of primary care and preventative services. However, in order for integrated PBHC services to be well utilized, it is vital to have buy in from mental and physical health providers. Most importantly, individuals with SMI must feel comfortable obtaining care where it

is provided, as well as believe that the care they receive is high quality, so that they are willing to return for follow-up treatment.

Integrated PBHC in CMH Settings

CMH centers, which provide services to millions of individuals with mental illness each year in the United States, are ideal locations to deliver coordinated care to individuals with SMI (Druss et al., 2010). Much of the extant research on integrated treatment is conducted within agencies such as the VA, which has the advantage of co-located and fully integrated services (Druss & Walker, 2011; Gerrity et al., 2014). However this is not feasible for many smaller CMH agencies that lack space, equipment, and staff to provide medical care on site (Druss et al. 2008). In addition, those with SMI may be fearful of physicians and reluctant to seek needed medical care; which underscores the importance of delivering physical health screening and preventative services in mental health settings that provide services to persons with SMI (Druss & Walker, 2011; Scharf et al., 2014). CMH centers are seen as safe places to obtain care, and individuals with SMI are less likely to drop out of mental health services than medical services (Olfson et al., 2009; Scharf et al., 2014).

Druss et al. (2008) surveyed 181 CMH centers to determine the feasibility of integrated care and found that many CMH centers relied on off-site medical services, despite the majority of sites (93%) indicating that their clients' physical health was a medium or high priority. Almost three fourths (71%) of CMH centers provided medical screenings, and only half of CMH centers had the ability to treat medical problems either on site or off site through referrals (Druss et al., 2008). Barriers to integrated care identified by the CMH centers included difficulties with reimbursement, physical space limitations, and limited referral options in the community (Druss et al. 2008). In addition, other studies have cited staff resistance to change, long-term costs,

concerns regarding confidentiality, and new roles for staff (e.g., nurse care managers) as barriers to integration of services (Gerrity et al., 2014; Scharf et al., 2014).

Although integrating behavioral health care into primary care settings has strong evidence of effectiveness (Woltmann et al., 2012), less research has examined the effectiveness of integrating PBHC in CMH settings for persons with SMI (Gerrity et al., 2014). Longitudinal research is limited, with only a few studies focusing on certain health outcomes at follow up (viz., Druss et al. 2010; Putz et al., 2015). The Primary Care Access, Referral, and Evaluation (PCARE) Study, a seminal longitudinal study, tested the effectiveness of implementing physical health services in a CMH setting for individuals with SMI (Druss et al., 2010). A randomized controlled trial was used to assign 407 clients either to services as usual (n=202) or physical health care management services (n=205, Druss et al., 2010). Nurse care managers administered the intervention, which consisted of motivational interviewing, developing action plans related to health behavior change, advocating for clients with other medical providers, and helping clients access benefits such as Medicaid (Druss et al., 2010). The sample was primarily African American (77.9%) and low income (Druss et al., 2010). Of those who were enrolled in the care management intervention, 78% completed 6-month follow up interviews and 69.2% completed 12-month follow up interviews (Druss et al., 2010). Of those who received services as usual, 69.3% completed 6-month follow up interviews and 66.8% completed 12-month follow up interviews (Druss et al., 2010). The majority of attrition (93%) was attributed to inability to locate clients, whereas the remaining proportion of clients (7%) was either deceased or withdrew from the study (Druss et al., 2010). Individuals in the intervention group doubled in their usage of preventative services over 12 months, receiving more physical exams, screenings, vaccinations, and educational interventions than the usual care group (Druss et al., 2010).

Previously undiagnosed medical conditions were identified in 11.9% of the intervention group, as compared to 1.8% of the control group (Druss et al, 2010). Further, laboratory data indicated that the intervention group decreased their risk of cardiovascular disease by 11.8%, while the control group increased their risk by 19.5% (Druss et al., 2010). These findings indicate that a care management approach was successful in identifying undiagnosed comorbid medical problems and enabling client access to preventative health services. Druss et al. (2010) note that these results are especially noteworthy because the nurses worked as advocates and health educators for clients who received the care management intervention without providing medical care services on site.

In an uncontrolled pretest-posttest evaluation, Putz et al. (2015) gathered longitudinal data from 169 individuals with SMI enrolled in a collaborative care intervention at a CMH center. The intervention involved a health assessment conducted by a doctor or nurse practitioner, followed by case management services, and individual and group wellness programs (Putz et al., 2015). The sample was primarily female (63%) and White (91%), and participants had at least one identified risk factor for metabolic disease (e.g., hypertension, diabetes, tobacco use; Putz et al., 2015). Study outcomes focused on changes in lab indicators of metabolic risk from baseline to 6-month follow up (Putz et al., 2015). Well over three fourths of the sample completed the 6-month follow up (87%), but reasons for attrition were not discussed (Putz et al., 2015). Results showed that the majority of participants lost weight (68%), and that other risk factors (hypertension, smoking) were significantly reduced at 6-month follow up (Putz et al., 2015). Although Putz et al. (2015) did not employ a rigorous evaluation design, the results showing improved health outcomes are consistent with those demonstrated by Druss et al. (2010) in the PCARE study.

Retention, Dropout, and Re-engagement in Treatment

For persons with SMI, remaining engaged with treatment providers is crucial because those who drop out of treatment are at greater risk of experiencing exacerbated mental health symptoms, more frequent hospitalizations, and higher rates of suicide (Kreyenbuhl et al., 2009). Individuals with SMI often require continuous care to manage their symptoms and monitor and adjust medications (Druss & Walker, 2011). In a review of 60 articles related to SMI and continuity of care, Crawford, de Jong, Freeman and Weaver (2004) concluded that consistency in care is especially important to clients with SMI. In a study of 411 individuals with SMI, Adair et al. (2005) found that greater continuity of care was associated with better quality of life, higher functioning, lower symptom severity, and decreased alcohol use. Adair et al. (2005) emphasized that continuity of care for a period of at least 12 months is recommended for individuals with SMI.

Continuity of care is relevant to medication and treatment adherence. Over half of individuals with SMI do not take their medications as prescribed, with research showing that patients are more likely to discontinue the use of antipsychotic medications because of personal choice, not because of side effects or lack of efficacy (Gold et al., 2008). Ongoing contact with health care providers enables clients with SMI to discuss their concerns about medications. Adjustments can be made before individuals decide to stop taking medications completely and face reemergence of debilitating symptoms. Retention in care is especially important for individuals with chronic conditions that require regular monitoring as a component of disease management; also, routine screenings can detect medical and behavioral health conditions sooner so they can be managed before they become debilitating (Mitchell & Lord, 2010; Parks et al., 2006). De Hert et al. (2011) identified the importance of monitoring of physical health conditions

in treatment adherence. Disengaging from either primary or behavioral health treatment is detrimental to individuals with comorbid conditions because mental and physical health disorders can exacerbate one another (Druss & Walker, 2011).

Mental health treatment dropout among persons with SMI has been defined in several ways in the literature, including disengagement from treatment during the previous year for reasons other than symptom improvement, and not completing recommended duration of treatment (Kreyenbuhl et al., 2009; Olfson et al., 2009). Retention in mental health treatment occurs when a client remains engaged with behavioral health care services for the recommended duration (Olfson et al., 2009). Re-engagement in treatment occurs when clients who previously dropped out of care return for services because of outreach from the service provider or the emergence of new mental or physical health conditions (Davis et al., 2012).

Using data from the National Comorbidity Survey Replication, Olfson et al. (2009) examined the cases of 1,164 individuals with various mental health diagnoses who received outpatient services in the previous year to identify correlates of mental health and primary care treatment dropout. Olfson et al. (2009) did not find any notable gender differences in dropout rates for either primary care or mental health services; however, non-Hispanic blacks were more likely than Whites to drop out of psychiatric treatment. In addition, Olfson et al. (2009) found that treatment dropout differed by provider type: Individuals were less likely to complete the recommended duration of treatment for primary care services, as compared to mental health services. Having health insurance decreased dropout risk, and previous mental health treatment decreased dropout rates among those receiving psychiatric care (Olfson et al., 2009). As individuals who receive disability benefits are entitled to treatment, it is likely that they would have higher rates of treatment retention.

Re-engagement in treatment after dropping out prematurely is especially important for individuals with SMI, as it may help decrease their risk of early mortality. A study conducted by the VA involved reaching out by letter or face-to-face contact (on the street, at shelters, or at hotels) to over 3000 patients with BPD or schizophrenia who had not attended follow-up appointments for at least one year prior (Davis et al., 2012). Almost three fourths (72%) of patients returned to the VA for care within 21 months of being contacted, with the majority returning within 7 months of contact (Davis et al., 2012). Those who refused care perceived having no need for services, and reported either dissatisfaction with VA services or difficulties with distance or transportation (Davis et al., 2012). The mortality rate of those who returned to care was about six times lower than that of those who did not return to care (Davis et al., 2012). This latter study highlights the importance of ensuring that individuals with SMI have ongoing access to mental and physical health care.

Additional reasons for treatment retention were explored in a VA study that compared prior service utilization of 6,687 veterans with SMI who remained engaged in treatment with 6,687 veterans who dropped out of treatment for a 12-month period (Abraham et al., 2013). Abraham et al. (2013) found that patients who more frequently accessed outpatient health care services were more likely to remain in treatment than those with higher numbers of hospitalizations. This latter finding suggests that the support made available through regular outpatient mental health care may help individuals with SMI remain engaged in treatment and avoid using emergency health services to meet their healthcare needs. A third study of individuals with SMI in a VA setting looked at 156,631 patients to compare patients with a 12-month gap in health or mental health services to those without such a gap (McCarthy et al., 2007). About one in five (21%) of patients had a 12-month gap in health services, and these

patients were more likely to be younger, non-White, and homeless (McCarthy et al., 2007). Well over one third (42%) of patients had a 12-month gap in mental health services, and these patients were more likely to be older and female (McCarthy et al., 2007). In addition, those who lived at least 25 miles from the nearest VA service site were more likely to report a 12-month gap in mental health services (McCarthy et al., 2007). These findings suggest that certain sociodemographic factors are important to consider in relation to treatment retention for individuals with SMI and patterns in treatment dropout may differ based upon service type.

Treatment Dropout among Clients with SMI

Olfson et al. (2009) examined treatment dropout among a sample of individuals with various mental health diagnoses who had dropped out of outpatient services in the previous year, which the authors defined as discontinuing services against the advice of the provider. Olfson et al. (2009) reported that one fifth of the overall sample had dropped out of treatment; and while 32% dropped out of primary care, rates of mental health treatment dropout were much lower, with patients of psychiatrists reporting the lowest treatment dropout rates, at 15%.

Approximately one fifth (19%) of individuals did not complete treatment recommended by other mental health professionals, such as psychologists and social workers (Olfson et al., 2009). Also, among those who did not complete the recommended course of treatment, the median number of visits before dropping out was three for primary care and four to six for mental health care (Olfson et al., 2009). Thus, type of treatment (primary care vs. mental health) appears to be associated with treatment dropout among persons with mental health issues, as does mental health provider type. Olfson et al. (2009) found that those with higher educational attainment were less likely to drop out of treatment. The authors also noted that past research identified

younger adults and unemployed persons as more likely to drop out of treatment (Olfson et al., 2009).

Patterns of treatment dropout are slightly different for individuals with SMI as compared to individuals with other mental health disorders. A literature review conducted by Kreyenbuhl et al. (2009) suggested that studies of individuals with SMI report, on average, a dropout rate of about one third, which is higher than that reported by Olfson et al. (2009) for individuals with a variety of mental health diagnoses. Kreyenbuhl et al. (2009) acknowledged that studies use different operational definitions of dropout, which is reflected in the notable variability of observed dropout rates. In general, studies showed that individuals with co-occurring psychiatric and substance use disorders were at high risk of treatment dropout, as were individuals with early-onset psychosis (Kreyenbuhl et al., 2009). Those with low levels of social support and lower educational attainment were also at increased risk of treatment dropout (Kreyenbuhl et al., 2009). For individuals with SMI, research shows that a positive therapeutic alliance is associated with treatment retention; and, conversely, clients who feel that their concerns are not heard have higher dropout rates (Kreyenbuhl et al., 2009). Therefore, providers are encouraged to focus on clear communication and establishing rapport with patients who have SMI so that the patients are more likely to feel satisfied with the care they are receiving.

Smith et al. (2013) defined disengaged clients as individuals who did not receive needed community-based mental health services, as determined by a review of utilization records. Using data from qualitative interviews with 56 individuals with SMI who had disengaged from treatment (despite having a high need) and with 25 providers who served this population, Smith et al. (2013) found that patients and providers differed in their views about reasons for treatment disengagement. Individuals with SMI who were disengaged reported that services did not meet

their needs or were irrelevant (Smith et al., 2013). Clients who were disengaged further stated they had difficulty trusting providers and saw them as critical or negative. Both providers and clients identified provider turnover as a contributor to treatment disengagement (Smith et al., 2013). Providers attributed treatment disengagement to stigma about accessing services and to clients' lack of awareness of symptoms (Smith et al., 2013). However, few clients (4%) identified stigma as a concern, whereas a much greater proportion (21%) believed they did not need mental health treatment (Smith et al., 2013). Providers and clients agreed that increased provider sensitivity and noncritical attitudes and assistance with transportation would improve rates of retention (Smith et al., 2013). Providers further identified family engagement as a potentially important strategy for increasing treatment retention (Smith et al., 2013). Although small in scope, the study by Smith et al. (2013) illustrates how providers and clients have different perspectives on reasons for treatment disengagement.

Lester et al. (2005) conducted a qualitative study with 45 patients with SMI and 47 health care providers in the United Kingdom to better understand why individuals with SMI drop out of medical care. Eighteen focus groups were conducted either with patients or health care providers; and each group followed a topic guide that encouraged discussion about members' perceptions of best possible care and problems related to receiving care (Lester et al., 2005). Focus group sessions were audiotaped and transcribed, and themes were identified (Lester et al., 2005). Doctors reported some communication difficulties with patients with SMI and patients and medical providers agreed that continuity of providers is important (Lester et al., 2005). Patients specifically mentioned they were better able to build trust and have open discussions when they had continuity with their providers, as well as stated that they preferred having one provider who could address both physical and mental health needs (Lester et al., 2005). Patients with SMI also

valued quick access to treatment (Lester et al., 2005). Patients and providers differed the most in their perceptions of causes of dropout: Patients attributed it to worsening mental illness or to difficulties making or attending appointments, while providers believed it was due to lifestyle choices and irrationality (Lester et al., 2005).

In another small study, DeCoux (2005) conducted semistructured interviews with 10 individuals with SMI and found that the majority sought health services for acute crises and that these individuals were highly satisfied with emergency medical services. Individuals in this latter study did not seek care before such crises because they feared not being taken seriously by medical professionals (DeCoux, 2005). The majority of (9) interviewees reported previous experiences where health professionals were dismissive about their symptoms (DeCoux, 2005). Further, all interviewees described deterrents to obtaining acute and outpatient care, which included professionals not providing adequate information and education about their health conditions (DeCoux, 2005). Studies conducted by Smith et al. (2013), Lester et al. (2005), and Decoux (2005) are similar in terms of utilization of small samples and qualitative methods; and the findings converge to show that viewpoints of individuals who have disengaged from treatment and those of providers may differ, warranting further exploration.

Summary and Implications of Literature Review

Individuals with SMI drop out of care at higher rates than individuals with other types of mental health diagnoses (Kreyenbuhl et al., 2009). Previous research has identified mental health dropout rates for individuals with SMI ranging from 15-30% (Kreyenbuhl et al., 2009; Olfson et al., 2009). Studies by Druss et al. (2010) and Putz et al. (2015) identified similar dropout rates of 22-30% (depending on intervention type) and 13%, respectively, at 6-month follow up for individuals with SMI in a CMH setting.

Several sociodemographic factors emerge as potentially relevant correlates of retention, including age (McCarthy et al., 2007), race (Olfson et al., 2009), and access to transportation (Davis et al., 2012). In addition, studies identified that those who are unemployed and have lower educational attainment are more likely to drop out of treatment (Kreyenbuhl et al., 2009; Olfson et al., 2009).

Individuals with SMI experience higher rates of cardiometabolic conditions than the general population; thus, Parks et al. (2006, 2008) recommend collecting information on personal history of cardiometabolic disorders and monitoring clients' scores on mechanical (e.g., diastolic BP, systolic BP, BMI) and laboratory indicators (e.g., blood glucose, LDL, HDL, TRI, and total cholesterol). It is advised that individuals with SMI receive such monitoring on an ongoing basis, and retention in care for 12 months or more is important for this population (Adair et al., 2005).

Parks et al. (2008) describe how early mortality in the SMI population is related to modifiable risk factors (e.g., smoking). Individuals with co-occurring substance use disorders are at increased risk of disengaging from treatment, and certain health-risk behaviors (i.e., smoking, drinking, and drug use) have been negatively associated with retention (Kreyenbuhl et al., 2009). Greater reliance on emergency health services has been linked to treatment dropout (Kreyenbuhl et al., 2009); thus, regular access to routine preventative and primary care services emerges as a potentially relevant correlate of retention in treatment.

Although small in scope, qualitative research findings suggest that the views of providers and patients differ as to why patients with SMI drop out of care (Lester et al., 2005; Smith et al., 2013). Patients believe that treatment dropout is associated with worsening mental health symptoms; thus patients' health status and certain psychosocial characteristics (e.g., level of

functioning) emerge as potentially relevant contributors to treatment retention (Lester et al., 2005). Research has shown that higher levels of social support are associated with better self-assessed health and daily functioning (Eklund & Hansson, 2007; Parks et al., 2008).

Treatment-related characteristics are also associated with retention in care. For example, patients and providers agree that effective communication is linked to retention (Lester et al., 2005; Smith et al., 2013) and that feeling respected and heard is important to clients (Kreyenbuhl et al., 2009); thus, satisfaction with care also emerges as a relevant correlate.

Understanding contributing factors to treatment retention is important as organizations increasingly move toward integrated models of care (Druss & Walker, 2011). Scharf et al. (2014) reported that SAMHSA-funded integrated programs had difficulty maintaining enrollment, but evaluators did not speculate on reasons for attrition. Predictors of treatment dropout and retention have been explored in both large-scale and qualitative studies of individuals with SMI and health care providers; however, no study to date has examined whether objective health data (i.e. health indicators) are associated with treatment retention in integrated PBHC programs in CMH settings. This study aims to increase existing knowledge about persons with SMI receiving integrated PBHC services by examining correlates of treatment retention, including potentially relevant sociodemographic, health, psychosocial, and treatment-related characteristics.

CHAPTER 3: CONCEPTUAL FRAMEWORK

This section discusses the purpose of the current study, the research questions considered, and defines key terms relevant to the study.

Purpose

The present study is descriptive and longitudinal in design. It examined various sociodemographic, health, psychosocial, and treatment characteristics of individuals with SMI to identify correlates of retention in care at 12 months out. The study used existing data collected at baseline and at follow up from clients enrolled in an integrated PBHC program at one CMH center in a southern state. The data included information from surveys, as well as objective health indicator scores recorded in clinical records.

Research Questions

This study was framed by the following research questions:

1. What are the sociodemographic, health, health-related, health-risk, psychosocial, and treatment-related characteristics of CMH clients in an integrated PBHC program?
2. What proportion of CMH clients in an integrated health program are retained in care at least 12 months?
3. What sociodemographic, health, health-related, health-risk, psychosocial, and treatment-related characteristics are associated with retention, at one year out, in an integrated health program?

Hypotheses

The current study tested the following hypotheses:

1. Individuals who have access to reliable transportation are more likely than those without reliable transportation to be retained in care at one year out.

2. Individuals with mood disorders are more likely than individuals with thought disorders to be retained in care at one year out.
3. Individuals who do not report a personal history of cardiometabolic disorders are more likely than those who do report this history to be retained in care at one year out.

Key Terms

This section defines the key terms comprising the research questions. The methodology section describes in further detail how each variable was measured.

Sociodemographic characteristics included age, gender, race, education level, employment status, disability status, living arrangement, and access to transportation. Age was defined as participants' self-reported age at baseline. Gender was defined as participants' self-reported gender at baseline. Race was defined as participants' self-reported race at baseline. Education level was defined as highest level of schooling attained, as self-reported at baseline. Employment status will include the two categories employed and unemployed, as self-reported at baseline. The original measure included the response options of part- or full-time work, both of which will comprise the employed option in this study. The original response options of looking for work, volunteer work, retired, and not looking for work, comprised the unemployed option for the variable, employment status, in this study. Disability status was determined by participants' self-report, and was recoded from the original measure of employment status, which included the response option of "unemployed, disabled." Disability status referred to whether or not the participant received disability benefits. Living arrangement referred to whether the participant lived alone or with someone else during the 30 days prior to baseline. Access to transportation was defined as participants' self-report of having reliable transportation at baseline.

Health characteristics included health indicator scores and participants' personal history of cardiometabolic disorders. Health indicator scores included the mechanical and laboratory indicators of health, as recorded in participants' clinical records at 6-month and 12-month reassessments. Personal history of cardiometabolic disorders is defined as self-reported history of diabetes, high BP, or cardiac problems at baseline. The health-related characteristic was participants' overall health, a subjective self-report measure of perceived overall health, as recorded at baseline. Health-risk characteristics were defined as participants' self-reported history of tobacco, alcohol, and other substance use at baseline, and whether the participant had a primary health care (PHC) provider.

Psychosocial characteristics included level of social support, level of functioning, psychological distress, and type of mental disorder. Social support was defined as participants' self-reported level of interpersonal support, as measured with a 4-item scale at baseline. This scale included questions about relationship satisfaction, perceived support, and feelings of belonging. Level of functioning was defined as participants' self-reported level of daily functioning, as measured with an 8-item scale at baseline. For example, the functioning scale assessed a participant's ability to deal with daily problems, feel in control of one's life, and get along with significant others. Psychological distress was defined as participants' self-reported feelings (e.g., nervousness, restlessness, depression), as measured with a 6-item scale at baseline. Type of mental disorder was defined as the primary mental health diagnosis as recorded in the clinical record. Diagnoses were recoded as either thought (e.g., schizophrenia) or mood disorders (e.g., depressive disorder, bipolar disorder).

Treatment-related characteristics included retention at 6 months from baseline, retention at 12 months from baseline, participants' satisfaction with services, frequency of mental health

services, and availability of lab indicator data. Retention at 6 months and at 12 months was defined as whether participant attended a recommended face-to-face follow-up interview at 6 months and at 12 months out, respectively. Retention at both 6 and 12 months was recoded using the date of the interview, as reported in the clinical record, as either yes (1) or no (0).

Participants' satisfaction with services was defined as participants' perceptions of care received at the CMH center, as assessed with a 14-item scale at the 6-month interview. Frequency of mental health services was defined as the number of mental health services received by participants annually, as reported by nurse care managers at the 6-month interview. The availability of lab indicator data was defined as whether participants' laboratory health indicator scores were recorded at baseline, and was coded as yes (1) or no (0).

CHAPTER 4: METHODOLOGY

This section describes the study sample, protection of human subjects, and study procedures. Instrumentation and data analysis methods are discussed.

Sample

The current longitudinal study analyzed existing data collected from 359 participants receiving integrated PBHC services at one CMH center. This sample was drawn from a larger database consisting of 1270 participants with SMI from three CMH sites, who comprised the sample of the original study, which was conducted from February 2012 to August 2015 (Lemieux et al., 2015). This sample included only those who were eligible to return for a 12-month reassessment; that is, individuals who had been admitted to the study within 12 months of the end date of the original study. One CMH site was selected for this study to eliminate potential site differences and because it had the greatest number of participants retained in care at one year out among the three original study sites. The CMH center in the original study is publicly funded and primarily serves individuals who are low-income and lack health insurance or are eligible to receive public benefits (Lemieux et al., 2015).

Original Study

The Integrated Health Program (IHP) in the original study by Lemieux et al. (2015) employed strategies similar to those described in Druss et al.'s (2010) PCARE study, which was rooted in Unützer, Harbin, Schoenbaum, and Druss' (2013) evidenced based model of integrated care and involved care coordination by nurse care managers. The IHP focused on CMH clients who lacked primary care, had not received a physical exam in the previous year, or presented with health complaints (Lemieux et al., 2015). A full-time registered nurse worked at each of the three CMH sites to provide co-located primary care services, administering health screenings,

linking clients to primary care services, referring clients to other needed prevention services, and collecting health-related and psychosocial data from clients (Lemieux et al., 2015). A major role of the nurse care manager was to be a health advocate for clients and provide them with education and support (Druss et al., 2010; Lemieux et al., 2015).

In the original study, informed consent was obtained from participants by CMH staff at baseline, and all clinical data were de-identified prior to analysis to ensure anonymity of participants. Thus, the original study was exempted from Institutional Review Board oversight by the primary researcher's affiliated university. Nurse care managers collected data from participants using the National Outcome Measures Client-level Measures (NOMs) tool, the IHP Baseline Physical Health Indicators Form (IHP-BPHIF), and the IHP Reassessment Health Indicators Form (IHP-RHIF). Following HIPAA privacy rules, the de-identified data from these tools were scanned at each site by researchers, and then entered into SPSS 21 for analysis (Lemieux et al., 2015).

The NOMs tool was administered by nurse care managers at baseline and at reassessment, every six months. It contains six major sections (viz. demographics, level of functioning, housing, education and employment, criminal justice history, and social connectedness) and additionally collects data describing services received by participants (e.g., mental health services, case management, and referrals). The Mental Health Statistics Improvement Program (MHSIP) scale, which was created by the National Association of State Mental Health Program Directors Research Institute, Behavioral Healthcare Performance Measurement System, is included within the NOMs to collect other relevant data, such as participants' perceptions of care (Jerrell, 2006; Schacht, 2001). The IHP-BPHIF includes seven sections for nurse care managers to record information about participants' primary care provider

and health insurance, health indicators (e.g., BP), health-risk behaviors (e.g., smoking), personal and family medical and substance use history, current medications, and relevant diagnoses (Lemieux et al., 2015). The IHP-RHIF, which was administered to participants with the NOMs at 6-month reassessment interviews throughout IHP treatment, served as a clinical registry and collected data on referrals, health indicators, and medications.

Instrumentation

Dependent Variable

The dependent variable for this study is retention in care at one year out from baseline. Retention at one year was recoded using the date that the face-to-face interview was conducted, as recorded on the IHP-RHIF. Presence of an interview date at the 12-month reassessment period indicated retention, and was recoded as either yes (1) or no (0).

Independent Variables

Sociodemographic Characteristics. Sociodemographic characteristics, collected with the NOMs tool at baseline, included age, gender, race, education level, employment status, disability status, living arrangement, and access to transportation. Age was measured in years with one self-report item. Participants' gender was obtained through one self-report item, with response options of Male (0) or Female (1). Participants' race/ethnicity was collected via one self-report item, with response options of Hispanic, African-American, Asian, Pacific Islander, Alaska Native, White, and American Indian. Given the distribution of responses reported by Lemieux et al. (2015) and Masinter (2016), race/ethnicity was dichotomized as White (0) and African American (1) for the present study. Level of education was measured with one self-report item describing participants' highest level of education completed, with response options including less than 12th grade, high school diploma or GED, vocational diploma, some college,

and bachelor's or graduate degree. For this study, education level was dichotomized as less than high school (0) and high school or higher (1). Information about employment and disability status was recoded from response options for the variable assessing employment status. Responses indicating employment (full or part time) and unemployment (looking for work, disabled, volunteer work, retired, or not looking for work) were dichotomized as employed (1) and unemployed (0). Disability status was computed using the "disabled" response to the item assessing employment status, and dichotomized as yes (1) or no (0). Information about living arrangement was recoded from participants' self-report on whether they were living on their own or with someone else during the 30 days prior to baseline. Response options of owned or rented house, apartment, trailer, or room and living at someone else's house, apartment, trailer, or room were dichotomized as living on own (1) and living with other (0), respectively. Access to transportation was measured with one self-report item recorded by nurse care managers on the IHP-BPHIF: "Do you have reliable transportation?" Response options for access to transportation were dichotomized (0=no, 1=yes).

Health Characteristics. Health characteristics included health indicator scores and participants' personal history of cardiometabolic disorders. Health indicator scores were recorded on the IHP-BPHIF. Mechanical health indicator scores included diastolic and systolic BP and BMI scores recorded at baseline. Laboratory indicator scores included fasting blood glucose, lipid total (i.e., total cholesterol), LDL, HDL, and TRI scores recorded at baseline. Three self-report items on the IHP-BPHIF measured personal history of cardiometabolic disorders, and asked participants to indicate whether they had ever been diagnosed with diabetes, high BP, or cardiac problems. Items assessing participants' history of cardiometabolic disorders were dichotomized as no (0) or yes (1).

Overall Health. Participants' overall health was a health-related characteristic and was measured with one general self-rated health (GSRH) question, "How would you rate your overall health right now?" (DeSalvo, Bloser, Reynolds, He, & Munter, 2005). Responses were on a 5-point likert scale ranging from 1 (poor) to 5 (excellent).

Health-Risk Characteristics. Health-risk characteristics included three self-report items on the IHP-BPHIF assessing participants' personal substance use history. The response options for the items indicating whether the participants used alcohol, tobacco, and illicit drugs were dichotomized (0=no, 1=yes). To measure whether participants had a PHC provider, one item on the IHP-BPHIF asked participants to report the name of their PHC provider. This item was dichotomized with presence of a name recoded as yes (1) and absence of a name recoded as no (0).

Psychosocial Characteristics. Psychosocial characteristics in the current study included level of social support, level of functioning, psychological stress, and type of mental disorder.

Social support was assessed with the NOMs 4-item Perception of Social Connectedness (PSC) subscale of the MHSIP (Schact, 2001). Participants were instructed to provide answers regarding their relationships with individuals other than their mental health providers, during the 30 days prior to baseline. Examples of items included, "I have people with whom I can do enjoyable things," and "in a crisis I would have the support I need from family or friends." Response options were measured with a 5-point likert scale from 1 (strongly disagree) to 5 (strongly agree), and responses are summed for a total PSC score between 4 and 20. Higher scores indicated higher levels of perceived social support. Lemieux et al. (2015) and Masinter (2016) reported Cronbach's alphas of .81 and .77, respectively, indicating adequate internal consistency.

Level of functioning was measured with eight NOMs items in the MHSIP Perception of Functioning (PF) subscale (Schacht, 2001). These items asked participants to assess their ability to manage various areas of their life during the 30 days prior to baseline. For example, items included, “I deal effectively with daily problems,” “I am able to deal with crises,” and “my symptoms are not bothering me.” A 5-point likert scale was used, with response options ranging from 1 (strongly disagree) to 5 (strongly agree). Items were summed to create a total PF scale score between 8 and 40, with higher scores indicating higher level of functioning. Lemieux et al. (2015) and Masinter (2016) reported Cronbach’s alphas of .76 and .75, respectively, indicating adequate internal consistency.

Psychological distress was measured via the NOMs with the 6-item K6 scale (Kessler et al., 2010). Participants were asked to report the frequency of specific feelings during the 30 days prior to baseline (e.g., nervousness, hopelessness, restlessness, and depression). Responses were measured with a 5-point likert scale, with 0 indicating none of the time, and 4 indicating all of the time. The items were summed for a total K6 score ranging from 0 and 24, with higher scores indicating higher levels of psychological stress (Kessler et al., 2010). Lemieux et al. (2015) and Masinter (2016) reported Cronbach’s alphas of .88 and .87, respectively, for the K6, indicating good internal consistency.

Type of mental disorder was measured with one item on the IHP-BPHIF indicating the primary mental disorder diagnosis, as recorded by the nurse care manager. Participants with a primary mental health diagnosis of schizophrenia or schizoaffective disorder were categorized as having a thought disorder (0), and participants with a primary mental health diagnosis of major depressive disorder or bipolar disorder were categorized as having a mood disorder (1).

Treatment-Related Characteristics. Treatment-related characteristics included retention at 6 months from baseline, satisfaction with services, frequency of mental health services, and availability of lab indicator data at baseline.

Retention at 6 months was recoded using the date of the 6-month face-to-face reassessment interview, as recorded on the IHP-RHIF. Presence of an interview date at 6-month reassessment indicated retention, and was coded as either yes (1) or no (0).

Participants' satisfaction with treatment was measured using the MHSIP Perception of Care (PC) scale embedded within the NOMs tool. The 14-item PC scale contained items such as "I felt free to complain," "Staff were sensitive to my cultural background," and "Staff helped me obtain the information I needed so that I could take charge of managing my illness." Responses were recorded with a 5-point likert scale (1=strongly disagree, 5=strongly agree), with higher scores indicating higher levels of satisfaction with care.

Frequency of mental health services was assessed with one item on the NOMs tool asking how often mental health services were provided to participants on an annual basis, as recorded by nurse care managers. The availability of lab indicator data at baseline was created from information recorded on the IHP-BPHIF by nurse care managers. If at least one of five lipid measures were reported, the individual was labeled as having lab indicator data. Availability of lab indicator data at baseline was dichotomized as no (0) or yes (1).

Data Analysis

To answer the first two research questions, descriptive statistics for non-parametric variables (e.g., gender, race, disability) were reported using frequencies and their respective percentages. Descriptive statistics for parametric variables (e.g., age, level of functioning,

treatment satisfaction) were reported using mean, range, and standard deviation (Rubin & Babbie, 1993).

To answer the third research question, bivariate statistics were used to examine associations between key variables of interest and treatment retention at one year out. T-tests were computed to examine differences in mean scores between continuous variables (e.g., overall health, frequency of mental health services), and both the t-statistic and level of significance were reported (Rubin & Babbie, 1993). Chi square tests of significance were computed to examine proportional differences between categorical variables (e.g., retention at 12 months, type of mental disorder; Rubin & Babbie, 1993).

CHAPTER 5: RESULTS

The current descriptive longitudinal study examined associations among sociodemographic, health, psychosocial, and treatment characteristics in a sample ($N=359$) of clients enrolled in an integrated health program. A power analysis determined that the sample size of 359 is sufficient to detect a medium effect size (0.6), with a p value set at .05 and a standard statistical power of 0.83-0.86 (Rubin & Babbie, 1993).

Sociodemographic Characteristics

As Table 1 displays, the sample was primarily female (58.8%), and the average age of participants was 44.9 ($SD=11.8$, Range=20-83). Nearly three fourths of participants was African American (74.6%), and just over one fourth was White (25.4%). The majority reported having at least a 12th grade education (60.4%), with just over one third of the sample reporting less than a 12th grade education (39.6%). As seen in Table 1, over seven times as many individuals were unemployed (87.9%) than were employed (12.1%). In terms of disability status, the majority of individuals reported no disability benefits (see Table 1). More respondents were living on their own (55.7%) than were living with someone else (44.3%; see Table 1). Lastly, as seen in Table 1, over two thirds had access to reliable transportation (70.5%).

Health Characteristics

Table 2 reports information about participants' laboratory and mechanical health indicators (i.e., mean, standard deviation, range) along with the frequency and proportion of the sample determined to be at risk, according to the cut points established by the Center for Integrated Health Solutions (CIHS; 2013). As seen in Table 2, the mean scores for systolic BP, BMI, and blood glucose fell above the at-risk cutoff scores (at 133.6, 33.0, and 111.4, respectively). The mean scores for diastolic BP, total lipid, LDL, and TRI fell below the at-risk

Table 1. Sociodemographic Characteristics (N=254-359)

	M	SD	Range	Frequency	%
Age	44.9	11.8	20-83	-	-
Gender					
Male	-	-	-	148	41.2
Female	-	-	-	211	58.8
Race					
African-American	-	-	-	259	74.6
White	-	-	-	88	25.4
Education					
<12 th grade	-	-	-	142	39.6
≥12 th grade	-	-	-	217	60.4
Employment Status					
Unemployed	-	-	-	305	87.9
Employed	-	-	-	42	12.1
Disability Status					
No Benefits	-	-	-	207	58.5
Benefits	-	-	-	147	41.5
Living Arrangement					
Living w/Other	-	-	-	148	44.3
Living on Own	-	-	-	186	55.7
Reliable Transportation					
No Access	-	-	-	75	29.5
Access	-	-	-	179	70.5

Table 2. Health Characteristics (N=332-359)

	M	SD	Range	Frequency	%
Systolic BP	133.6	20.7	93-208	-	-
Not at risk	-	-	-	164	45.7
At risk ≥130	-	-	-	95	54.3
Diastolic BP	76.6	13.2	40-114	-	-
Not at risk	-	-	-	263	73.3
At risk ≥85	-	-	-	96	26.7
BMI	33.0	9.7	16-70	-	-
Not at risk	-	-	-	71	19.8
At risk ≥25	-	-	-	287	80.2
Blood Glucose	111.4	62.3	56-517	-	-
Not at risk	-	-	-	213	61.2
At risk ≥100	-	-	-	135	38.8

(Table 2 continued)

	M	SD	Range	Frequency	%
Total Lipid	190.7	44.6	75-344	-	-
Not at risk	-	-	-	212	61.1
At risk ≥ 200	-	-	-	135	38.9
HDL	49.7	19.8	17-201	-	-
Not at risk	-	-	-	240	70.0
At risk < 40	-	-	-	103	30.0
LDL	118.3	44.0	27-400	-	-
Not at risk	-	-	-	224	65.9
At risk ≥ 130	-	-	-	116	34.1
TRI	129.6	90.2	28-576	-	-
Not at risk	-	-	-	252	73.0
At risk ≥ 150	-	-	-	93	27.0
Personal HX: Diabetes					
No	-	-	-	263	79.2
Yes	-	-	-	69	20.8
Personal HX: High BP					
No	-	-	-	166	47.3
Yes	-	-	-	185	52.7
Personal HX: Cardiac Problems					
No	-	-	-	314	89.0
Yes	-	-	-	39	11.0

cut points, whereas the mean HDL score exceeded the cut point of 40, in a positive direction (CIHS, 2013). As seen in Table 2, a greater proportion was at risk on the measure of systolic BP (54.3%). Over four times as many participants had at-risk BMI scores (80.2%) than did not have at-risk BMI scores (19.8%; see Table 2). For both diastolic BP and TRI, approximately one fourth of participants was at risk (see Table 2). For blood glucose, total lipid, and LDL, approximately one third of participants was at risk (see Table 2). Just under one third of participants had HDL scores below 40, placing them at risk (see Table 2). In terms of personal history of cardiometabolic disorders, under one fourth of the sample reported a personal history

of diabetes (20.8%), over half reported a personal history of high blood pressure (52.7%), and less than one sixth reported a personal history of cardiac problems (11.0%).

Overall Health and Health-Risk Characteristics

Table 3 describes the sample in terms of overall health and health-risk characteristics. As seen in Table 3, the mean score for participants on the measure of self-assessed health was 2.6 ($SD=1.1$, Range=1-5), indicating that respondents on average reported their health as between good and fair. Just over one fourth of participants reported alcohol use (26.2%), whereas just over one half reported tobacco use (50.1%). A much smaller proportion (8.6%) reported use of non prescribed drugs. As seen in Table 3, almost two thirds of respondents reported that they did not have a PHC provider at baseline (65.7%).

Table 3. Overall Health, Health Risk Characteristics ($N=332-359$)

	M	SD	Range	Frequency	%
Overall Health	2.6	1.1	1-5	-	-
Personal HX: Alcohol					
No	-	-	-	265	73.8
Yes	-	-	-	94	26.2
Personal HX: Tobacco					
No	-	-	-	179	49.9
Yes	-	-	-	180	50.1
Personal HX: Other substance					
No	-	-	-	328	91.4
Yes	-	-	-	31	8.6
PHC Provider					
No	-	-	-	218	65.7
Yes	-	-	-	114	34.3

Psychosocial Characteristics

Table 4 describes the psychosocial characteristics of the sample. As seen in Table 4, the average social support score was 15.1 ($SD=2.8$, Range=5-20), indicating relatively high levels of social support. The mean perception of functioning scale score was 23.7 ($SD=5.1$, Range=9-35),

which indicates that participants perceived themselves as functioning moderately well. Participants' mean psychological distress score was 10.7 ($SD=6.8$, Range=0-24), indicating moderate levels of psychological distress. Cronbach's alpha for the social support scale was .78, indicating adequate internal consistency. In terms of the scale assessing participants' functioning, one item assessing functioning in school and work was problematic because individuals who were not in school or employed answered this item rather than selecting "not applicable." As the majority of the sample was unemployed, the item was omitted. A Cronbach's alpha was computed, and the results showed that the 7-item version of the PF subscale yielded a higher alpha (.83) than the 8-item version (.79). Cronbach's alpha for the psychological distress scale was .91, indicating good internal consistency. Just under two thirds of the sample was diagnosed with a mood disorder (61.7%) and the remaining individuals were diagnosed with a thought disorder (38.3%).

Table 4. Psychosocial, Treatment-Related Characteristics ($N=103-359$)

	M	SD	Range	Frequency	%
Social Support	15.1	2.8	5-20	-	-
Perception of Functioning	23.7	5.1	9-35	-	-
Psychological Distress	10.7	6.8	0-24	-	-
Type of Mental Disorder					
Thought Disorder	-	-	-	119	38.3
Mood Disorder	-	-	-	192	61.7
Retention at 6 months					
No	-	-	-	190	52.9
Yes	-	-	-	169	47.1
Lab Indicator Data					
No	-	-	-	14	3.9
Yes	-	-	-	345	96.1
Perception of Care	59.2	7.2	36-70	-	-
Frequency of MH Services	20.3	9.6	7-54	-	-

Treatment-Related Characteristics

As seen in Table 4, slightly less than half of the sample was retained at six months (47.1%). The vast majority of participants (96.1%) had lab indicator data available at baseline. The mean perception of care scale score at six months was 59.2 ($SD=7.2$, Range=36-70), indicating that respondents, on average, reported high levels of satisfaction with care received at the CMH center. Cronbach's alpha for the perception of care scale was .93 indicating good internal consistency. Participants reported an average of 20.3 ($SD=9.6$, Range=7-54) mental health services received annually (see Table 4).

Treatment Retention

Of the 359 individuals eligible to return for a 12-month reassessment, 105 (29.2%) were retained in treatment and completed the 12-month reassessment interview. Chi square tests of significance were conducted to examine proportional differences in treatment retention across key sociodemographic, health, and health-risk characteristics (see Table 5). Compared to those who did not have access to reliable transportation, those who did have access were more likely to be retained in treatment at 12 months, at $X^2(1, N=254) = 6.24, p < .05$. As seen in Table 5, retention at 6 months was significantly associated with retention at 12 months, at $X^2(1, N=359) = 155.05, p < .001$. Those who reported use of non-prescribed drugs were significantly less likely to be retained in treatment at 12 months out, at $X^2(1, N=359) = 4.38, p < .05$. No other significant differences emerged between retention at 12 months and key characteristics. Although not statistically significant, the proportion of individuals with a PHC provider who were retained in treatment for 12 months (34.2%) was considerably greater than those without a PHC provider who were retained at 12 months out (24.3%).

Table 5. Proportional Differences in Treatment Retention

	Retained for 12 months		Not Retained for 12 months		<i>p</i>
	<i>n</i>	%	<i>n</i>	%	
Gender					
Male	47	31.8	101	68.2	
Female	58	27.5	153	72.5	.381
Race					
African-American	72	27.8	187	72.2	
White	28	31.8	60	68.2	.472
Education					
<12 th grade	41	28.9	101	71.1	
≥12 th grade	64	29.5	153	70.5	.900
Employment Status					
Unemployed	92	30.2	213	69.8	
Employed	13	31.0	29	69.0	.917
Disability Status					
No Benefits	58	28.0	149	72.0	
Benefits	47	32.0	100	68.0	.422
Living Arrangement					
Living w/Other	43	29.1	105	70.9	
Living on Own	59	31.7	127	68.3	.599
Reliable Transportation					
No Access	10	13.3	65	86.7	
Access	50	27.9	129	72.1	.012*
Systolic BP					
Not at-risk	45	27.4	119	72.6	
At-risk ≥130	60	30.8	135	69.2	.490
Diastolic BP					
Not at-risk	80	30.4	183	69.6	
At-risk ≥85	25	26.0	71	74.0	.420
BMI					
Not at-risk	21	29.6	50	70.4	
At-risk ≥25	83	28.9	204	71.1	.913
Blood Glucose					
Not at-risk	66	31.0	147	69.0	
At-risk ≥100	38	28.1	97	71.9	.573
Total Lipid					
Not at-risk	63	29.7	149	70.3	
At-risk ≥200	40	29.6	95	70.4	.986
HDL					
Not at-risk	72	30.0	168	70.0	
At-risk <40	31	30.1	72	69.9	.986

(Table 5 continued)

	Retained for 12 months		Not Retained for 12 months		<i>p</i>
	<i>n</i>	%	<i>n</i>	%	
LDL					
Not at-risk	65	29.0	159	71.0	
At-risk ≥ 130	34	29.3	82	70.7	.955
TRI					
Not at-risk	73	29.0	179	71.0	
At-risk ≥ 150	29	31.2	64	68.8	.689
Personal HX: Diabetes					
No	79	30.0	184	70.0	
Yes	21	30.4	48	69.6	.949
Personal HX: High BP					
No	44	26.5	122	73.5	
Yes	58	31.4	127	68.6	.318
Personal HX: Cardiac Problems					
No	95	30.3	219	69.7	
Yes	9	23.1	30	76.9	.354
Personal HX: Alcohol					
No	77	29.1	188	70.9	
Yes	28	29.8	66	70.2	.894
Personal HX: Tobacco					
No	52	29.1	127	70.9	
Yes	53	29.4	127	70.6	.935
Personal HX: Other substance					
No	101	30.8	227	69.2	
Yes	4	12.9	27	87.1	.036*
PHC Provider					
No	53	24.3	165	75.7	
Yes	39	34.2	75	65.8	.056
Type of Mental Disorder					
Thought Disorder	37	31.1	82	68.9	
Mood Disorder	49	25.5	143	74.5	.286
Retention at 6 months					
No	2	1.1	188	98.9	
Yes	103	60.9	66	39.1	.000***
Lab Indicator Data at Baseline					
No	2	14.3	12	85.7	
Yes	103	29.9	242	70.1	.209

* $p < .05$, ** $p < .01$, *** $p < .001$

Independent-samples *t* tests were calculated to examine differences between those who were retained in treatment for 12 months and those who were not, across age, overall health, and key psychosocial and treatment-related characteristics (see Table 6). No significant differences emerged between participants who were and were not retained in treatment at 12 months out, across any of these latter characteristics.

Table 6. Mean Differences in Treatment Retention at 12 months

	Mean	SD	<i>t</i>	<i>df</i>	<i>p</i>
Age					
Not Retained	44.5	11.8			
Retained	46.0	11.6	-1.136	355	.257
Overall Health					
Not Retained	2.6	1.1			
Retained	2.6	1.1	-.447	341	.655
Social Support					
Not Retained	15.0	2.7			
Retained	15.4	2.8	-1.395	355	.164
Perception of Functioning					
Not Retained	23.6	5.0			
Retained	23.7	5.1	-.175	349	.862
Psychological Distress					
Not Retained	10.6	6.9			
Retained	10.8	6.5	-.168	340	.867
Perception of Care					
Not Retained	58.4	7.7			
Retained	59.8	6.7	-1.228	164	.221
Frequency of MH Services					
Not Retained	17.1	7.6			
Retained	18.0	9.1	-.697	177	.487

CHAPTER 6: DISCUSSION

The current study examined associations among sociodemographic, health, psychosocial, and treatment-related characteristics and treatment retention in individuals with SMI enrolled in an integrated PBHC program in one CMH center. A main goal of the present study was to identify factors associated with retention in a co-located PBHC setting. Few studies look at treatment retention in the SMI population, and those that do are qualitative and small in scope (e.g., DeCoux, 2005; Lester et al., 2005; Smith et al., 2013) or are conducted by the VA (e.g., Abraham et al., 2013; McCarthy et al., 2007). Results of the current study have implications for practice with individuals with SMI in integrated care settings because several variables were significantly associated with treatment retention at one year out (access to transportation, no personal history of non prescribed substance use, and retention at 6 months). However, other variables that have emerged as important correlates of retention in previous research (e.g., age, level of education, social support) were not significantly associated with retention in the present study (Kreyenbuhl et al., 2009; McCarthy et al., 2007; Olfson et al., 2009).

The results of the current study did support Hypothesis 1 but did not support Hypotheses 2 and 3. A significantly greater proportion of individuals with access to reliable transportation (as compared to those with no access) were retained in care at 12 months out (Hypothesis 1). This finding was consistent with previous research. McCarthy et al. (2007) found that individuals with SMI who lived farther away from the VA had lower rates of retention, and Davis et al. (2012) reported that individuals with SMI who dropped out of treatment commonly cited difficulty with transportation as a reason for not returning.

No significant difference emerged between the proportions of individuals with thought and mood disorders retained in care at 12 months (Hypothesis 2). This was inconsistent with

findings of previous research. Kreyenbuhl et al. (2009) reported that individuals with early-onset psychosis were at high risk of treatment dropout, which suggests that individuals with thought disorders may be less likely to be retained in treatment. Kreyenbuhl et al. (2009) noted that individuals with schizophrenia who received more intense and specialized support showed greater retention rates, so it is possible that the support provided at the CMH center promoted better retention rates among patients with thought disorders.

There was no significant difference between the proportions of participants who reported and who did not report a personal history of cardiometabolic disorders who were retained in care at one year out (Hypothesis 3). Previous research has not examined the association between health conditions and treatment retention among individuals with SMI in integrated PBHC programs. However, this finding was unexpected. Past research has identified that cardiometabolic disorders can exacerbate mental health symptoms (Gleason et al., 2014), and clients with SMI cited worsening mental health symptoms as a reason for treatment dropout (Smith et al., 2013).

Olfson et al. (2009) found that well over three fourths of individuals with various mental health diagnoses were retained in outpatient mental health treatment over one year. The majority of treatment dropout occurred after the first two visits, however due to varying time elapsed between visits, estimated time to dropout was not measured (Olfson et al., 2009). Individuals with SMI, however, tend to report lower retention rates than individuals with other mental disorders (Kreyenbuhl et al., 2009). The 6-month rate of retention was 47.1% in the current study. The 12-month retention rate was 29.2%, which is consistent with previous research showing that retention rates at one year out are typically around 30-40% for clients with SMI (Kreyenbuhl et al., 2009). However, studies of clients with SMI in integrated PBHC programs

conducted by Druss et al. (2010) and Putz et al. (2015) reported a 12-month retention rate of 66.8% and a 6-month retention rate of 87%, respectively.

Sociodemographic Characteristics

Among sociodemographic characteristics, no variables other than access to reliable transportation were significantly associated with retention at one year out. In terms of age, McCarthy et al. (2007) reported that younger adults were more likely to have a 12-month gap in health services, and older adults were more likely to have a 12-month gap in mental health services. In the current study, no significant differences in age emerged between those who were and were not retained in care; however the sample was predominantly middle to older age adults. Also, McCarthy et al. (2007) looked at health and mental health retention separately, with different age-related findings in each setting. The current study may not have yielded such differences as it considered retention in an integrated PBHC program. Olfson et al. (2009) did not find any significant differences in rates of treatment dropout between men and women with mental health diagnoses, and no gender differences emerged in the current study. Olfson et al. (2009) found that non-Hispanic blacks were more likely to drop out of psychiatric treatment and that higher education levels were associated with lower dropout rates. In the present study, there were no significant differences between the proportions of Blacks and Whites retained in treatment for 12 months, or between those with less than a high school education and those with a high school education or greater. Olfson et al. (2009) found that unemployed persons with SMI were more likely to drop out of treatment, but employment status was not associated with treatment retention in the current study. Very few respondents in the current study were employed (12.1%), so it is possible that there was insufficient power to detect a difference in 12-month retention rates. Finally, disability status was not associated with retention at one year out.

Health Characteristics

There were no significant differences in mean laboratory and mechanical health indicator scores at baseline between those who were and were not retained at one year out. This means that objective health data and certain chronic health conditions did not distinguish those who were retained in care from those who were not. Comorbid physical health symptoms are common among those with SMI, and disengagement from treatment can exacerbate symptoms (Druss & Walker, 2011). The current study suggests that other factors are more important to treatment retention than health characteristics, at least for participants enrolled in this particular integrated PBHC program.

Overall Health

The mean GSRH scores assessing overall health did not differ between those who were and were not retained at one year out. As noted above, individuals who were and were not retained did not significantly differ with respect to any of the laboratory or mechanical health indicators; thus, participants' self-assessed health may be consistent with other health data that were collected. A difference between retention rates, therefore, would be unlikely. Previous research shows that better perceived overall health is correlated with higher levels of social support (Eklund & Hansson, 2007). In the current study the mean overall health and social support scores were nearly identical for participants who were and were not retained.

Health-Risk Characteristics

Among the health-risk characteristics, only illicit drug use was associated with treatment retention. A significantly greater proportion of individuals who reported no illicit drug use was retained in care at one year out. No significant differences emerged with respect to alcohol and tobacco use. Kreyenbuhl et al. (2009) discussed the increased risk of treatment dropout for

individuals with co-occurring disorders. On the one hand, it is possible that the association between drug use and retention is a spurious finding due to the small number of participants who reported drug use (n=31, 8.6%). Conversely, illicit drug use could reflect problematic and harmful lifestyle choices, which providers who work with patients with SMI identify as a contributor to treatment dropout (Lester et al., 2005). No significant differences emerged between the proportion of participants with a PHC provider and the proportion of participants without a PHC provider who were retained in care at one year out. Those with a PHC provider reported nearly a 10% higher rate of retention, which is somewhat consistent with research by Kreyenbuhl et al. (2009) showing that individuals with SMI who rely more so on emergency health services are less likely to be retained in care. However, the current study did not measure participants' utilization of emergency health services.

Psychosocial Characteristics

In terms of psychosocial characteristics, no significant differences emerged between those who were and were not retained in care. Lower levels of social support have been associated with increased risk of treatment dropout in previous research (Kreyenbuhl et al., 2009). In the current study, mean PSC scale scores at baseline were nearly identical between those who were and were not retained in treatment at one year out. Qualitative studies have indicated that individuals with SMI report worsening mental health symptoms as a reason for treatment dropout (Smith et al., 2013). This suggests that individuals who are retained in care would report considerably higher levels of functioning and less psychological distress. However, evidence for this was not found in the current study. It should be noted that psychosocial characteristics were assessed at baseline in the present study. Thus, it is possible that those who were functioning well and were less symptomatic at baseline may have deteriorated over time.

Also, Smith et al. (2013) reported that targeting high-need individuals may have resulted in a selection bias, thereby limiting generalizability of results to persons with higher levels of symptomology.

Treatment-Related Characteristics

A significantly greater proportion of individuals who completed a 6-month reassessment were retained at one year out (60.9%), as compared to those who did not complete the 6-month reassessment (1.1%). The overall rate of retention decreased 17.9 percent from the 6-month to the 12-month reassessment period. About two thirds of the sample that was retained at 6 months was also retained at 12 months, which suggests that most individuals decided whether or not to remain in care well before the 12-month reassessment period. Dissatisfaction with services was cited as a reason for treatment dropout in a study of individuals with SMI receiving VA services (Davis et al., 2012). In a similar vein, Smith et al. (2013) highlighted the importance of providers building rapport with their patients in order to enhance treatment retention. In the present study, no significant differences emerged in the mean PC scores between those who were and were not retained in care. However, the PC scale scores were uniformly high. It is possible that this measure of treatment satisfaction was biased because it was administered during the 6-month reassessment interview. In fact, the majority of participants (52.9%) had already discontinued services by the 6-month reassessment period; hence, the PC scale scores likely reflect a response bias, which is why the scores are high in the current study. Mazor, Clauser, Field, Yood, and Gurwitz (2002) found that patient satisfaction surveys overestimate satisfaction as more satisfied patients have higher response rates than less satisfied patients.

Conclusions

Key findings of the current study highlight the relevance of certain sociodemographic (access to transportation), health-risk (illicit drug use), and treatment-related characteristics (retention at 6 months) to treatment retention at one year out in a sample of clients enrolled in an integrated PBHC program. No health or psychosocial characteristics were significantly associated with retention at one year out.

Limitations and Strengths

This study has various methodological limitations that are important to consider. As all data were collected from one CMH center, these findings are only generalizable to similar client populations in similar co-located PBHC programs. Data describing satisfaction with care were not collected from individuals who discontinued services; thus, the reasons for not remaining in care are unknown. In addition, it is possible that retention at the CMH center was higher than that reported by the PBHC staff, as participants may have continued to attend appointments with other CMH staff, such as their psychiatrist, but not with the RN care manager. Further, the majority of participants was 45 years of age or older, which limits generalizability of findings to younger clients in integrated PBHC programs. There also is a potential for selection bias as PC scores were only measured at 6-month reassessment. It is possible that clients who were dissatisfied chose not to return before this time, and the average PC scores of the sample are inflated because satisfaction data were not collected from those who were not retained in care.

In spite of these limitations, this study adds new knowledge about the retention of CMH clients in an integrated PBHC program, which has not been examined in existing research. It is the first known longitudinal study to examine correlates of treatment retention at one year out in an integrated health care setting. Existing research on retention among clients with SMI has

either been conducted in a VA setting (e.g., Abraham et al., 2013; McCarthy et al., 2007) or is qualitative and small in scope (e.g., DeCoux, 2005; Lester et al., 2005; Smith et al., 2013).

Another strength of this study is that it includes psychosocial correlates of health (e.g., social support) as well as objective (e.g., health indicators) and subjective measures of health (e.g., perceptions of overall health).

Future Research

The current study found that retention at 6 months was significantly associated with retention at 1 year out. Consistent with these findings, Druss et al. (2010) found that the majority of participants in an integrated PBHC program who were retained in treatment at 6 months were also retained at 12 months. Thus, future research should examine factors associated with treatment retention at 6 months. The finding that illicit drug use was negatively associated with treatment retention was based on a small subsample of participants (8.6%), thus future research should specifically examine the impact of co-occurring substance use on treatment retention in integrated PBHC programs. It would also be beneficial to explore potentially relevant factors associated with illicit drug use that are predictive of lower retention rates. A large proportion of individuals with SMI regularly rely on emergency health care (Miller et al., 2003), and such heavy utilization has been associated with treatment dropout (Kreyehbuhl et al., 2009). Future studies should include measures of emergency health care usage, as the data set used in the current study did not include sufficient information to analyze this potentially relevant correlate of retention. Incorporating a reliable measure of emergency service utilization would allow researchers to more accurately assess the extent to which individuals are using primary and other health care services. Lastly, future studies should include a more comprehensive measure of treatment satisfaction that specifically assesses the quality of participants' relationships with both

primary and behavioral health care providers. The current study used the PC scale, which asked questions about various aspects of satisfaction with the CMH center services and staff, but the items likely were too broad. Previous qualitative research on treatment dropout indicates that the patient-provider relationship and trust are very important for retention (Druss & Walker, 2011), and future studies should include measures that better assess the quality of the provider-client relationship.

Implications for Social Work

The current study highlights the importance of considering clients' access to transportation as a particular type of resource that supports treatment retention. Social workers should ask clients questions about their resources for care as part of a comprehensive assessment, as well as identify any potential barriers to treatment retention. Few correlates of treatment retention emerged in the current study, despite the fact that numerous predictors, such as age, education level, and social support were identified in previous research (Kreyenbuhl et al., 2009; McCarthy et al., 2007; Olfson et al., 2009). The client, therefore, may be the best source of information about potential barriers to retention. Clients are the most knowledgeable about their life circumstances, and the current study indicated that a number of presumably influential predictors of retention, such as personal health history, treatment satisfaction, and heightened symptomology (Kreyenbuhl et al., 2009; Lester et al., 2005; Parks et al., 2006, 2008) were, in fact, not relevant. The association between illicit drug use and retention merits additional attention as it suggests that it is important for social workers and other providers to be non-judgmental and initially tolerant of some substance using behavior until a therapeutic relationship is established. For example, Mueser and Gingerich (2013) suggest using low stress approaches involving empathy and calm and direct communication when working with

individuals with co-occurring substance use and mental disorders. In addition, a harm-reduction approach is recommended if individuals demonstrate low levels of motivation to stop using and are often involved with high-risk behaviors related to obtaining and using illicit drugs (Mueser & Gingerich, 2013). Participants who reported illicit drug use in the current study were not diagnosed with a co-occurring substance use disorder. Nevertheless, it bears mention that mental health providers identify stigma as a barrier to treatment retention in the SMI population (Smith et al., 2013), and those who use illicit drugs may be wary of providers due to their use of substances.

It is important that social workers are aware of barriers to treatment retention because continuity of care for persons with SMI is empirically linked to improved health and functioning (Adair et al., 2005). Persons with SMI are at heightened risk of developing cardiometabolic conditions; thus, consistent monitoring and the care provided through CMH centers can potentially reduce morbidity and mortality (Druss et al., 2010). Care continuity enables those with chronic conditions to better manage their symptoms (Druss & Walker, 2011). Lastly, the cost of care for individuals with SMI is high due to the prevalence of comorbid conditions (Kronick et al., 2009). Supporting retention in integrated PBHC settings can help reduce healthcare costs due to improved health outcomes (Druss et al., 2010; Putz et al., 2015), quality of life (Woltmann et al., 2012), and decreased reliance on emergency services to meet mental and physical health needs. Thus, future research also should examine whether retention in integrated care settings is associated with improved health outcomes.

In conclusion, the current study aimed to explore potential predictors of treatment retention among CMH clients with SMI in an integrated PBHC setting. This is the first known study to explore associations between objective health data (health indicators and

cardiometabolic conditions) and treatment retention in the SMI population, and surprisingly, no significant relationships emerged. Significant associations were found between treatment retention at 1 year out and reliable transportation, illicit drug use, and retention at 6 months; these findings are similar to those of previous research describing treatment retention in the SMI population (Davis et al., 2012; Druss et al., 2010; Kreyenbuhl et al., 2009; McCarthy et al., 2007). Future studies in integrated PBHC settings should examine correlates of retention at 6 months and employ multivariate approaches to determine the combination of health-related, psychosocial, and treatment-related characteristics that best explain retention in care.

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APPENDIX

LSU IRB APPROVAL FOR EXEMPTION FROM INSTITUTIONAL OVERSIGHT



ACTION ON EXEMPTION APPROVAL REQUEST

TO: Katherine Thomas
Social Work

FROM: Dennis Landin
Chair, Institutional Review Board

DATE: January 20, 2017

RE: IRB# E10293

TITLE: Sociodemographic, Health, Health-Related, Health Risk, Psychosocial, and Treatment-Related Characteristics Associated with Retention Among Community Mental Health Clients in an Integrated Health Program

Institutional Review Board
Dr. Dennis Landin, Chair
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New Protocol/Modification/Continuation: New Protocol

Review Date: 1/20/2017

Approved **Disapproved**

Approval Date: 1/20/2017 **Approval Expiration Date:** 1/19/2020

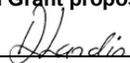
Exemption Category/Paragraph: 4a

Signed Consent Waived?: N/A

Re-review frequency: (three years unless otherwise stated)

LSU Proposal Number (if applicable):

Protocol Matches Scope of Work in Grant proposal: (if applicable)

By: Dennis Landin, Chairman 

PRINCIPAL INVESTIGATOR: PLEASE READ THE FOLLOWING – Continuing approval is CONDITIONAL on:

1. Adherence to the approved protocol, familiarity with, and adherence to the ethical standards of the Belmont Report, and LSU's Assurance of Compliance with DHHS regulations for the protection of human subjects*
2. Prior approval of a change in protocol, including revision of the consent documents or an increase in the number of subjects over that approved.
3. Obtaining renewed approval (or submittal of a termination report), prior to the approval expiration date, upon request by the IRB office (irrespective of when the project actually begins); notification of project termination.
4. Retention of documentation of informed consent and study records for at least 3 years after the study ends.
5. Continuing attention to the physical and psychological well-being and informed consent of the individual participants, including notification of new information that might affect consent.
6. A prompt report to the IRB of any adverse event affecting a participant potentially arising from the study.
7. Notification of the IRB of a serious compliance failure.
8. **SPECIAL NOTE: When emailing more than one recipient, make sure you use bcc. Approvals will automatically be closed by the IRB on the expiration date unless the PI requests a continuation.**

* All investigators and support staff have access to copies of the Belmont Report, LSU's Assurance with DHHS, DHHS (45 CFR 46) and FDA regulations governing use of human subjects, and other relevant documents in print in this office or on our World Wide Web site at <http://www.lsu.edu/irb>

VITA

Katherine Anne Thomas was raised in Delmar, New York. She graduated cum laude with a Bachelor of Science in Brain and Cognitive Sciences and a Bachelor of Arts in Psychology from University of Rochester in 2014. In college she was involved with research under Dr. Diane Morse studying physical and mental health of women in the criminal justice setting. Upon graduation Katherine served one year in the Rochester AmeriCorps program as an academic advisor for high school students enrolled in the Upward Bound program at Monroe High School in Rochester, New York.

Katherine entered Louisiana State University in Fall of 2015 to pursue her Master of Social Work and expects to graduate in May 2017. She has participated in internships at the HIV/AIDS Alliance for Region Two and the Tau Adolescent Center at Our Lady of the Lake Regional Medical Center. Katherine was selected as a Behavioral Health Workforce Education and Training Scholar to support her advanced year field internship serving youth at risk for behavioral health disorders. Katherine plans to gain further clinical experience working as a social worker in a medical setting upon graduation and plans to continue her education in the future through doctoral studies.