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Interrelationships Among Physical Health, Health Risk Factors, Psychosocial Characteristics, and Social Support in Individuals with Major Depressive Disorder Receiving Integrated Care in Community Mental Health Settings

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ABSTRACT

Integrated primary and behavioral health care (PBHC) programs in community mental health (CMH) settings is a topic of burgeoning interest in the current literature. These settings aim to counter the health discrepancies and inordinate mortality of persons with serious mental illness (SMI) and comorbid medical conditions. Within the SMI population, the most prevalent diagnosis is Major Depression (MDD). MDD has been well studied in the literature and has been associated with increased rates of physical health conditions. Research has correlated higher levels of social support to lower levels of psychological distress and increased physical health. This cross-sectional, descriptive study examines interrelationships among physical health, health-risk factors, psychosocial characteristics, and social support in individuals with the mood disorder MDD who are receiving integrated care in community mental health settings. A de-identified data set was utilized to examine results of 407 individuals with MDD receiving integrated PBHC in CMH settings. An integrated PBHC data set is a relevant addition to the research on MDD and social support because neither of these areas has been adequately addressed in the previous literature. The results have implications for not only the impact of social support and treatment of MDD but for the increased implementation of these programs.

CHAPTER 1: INTRODUCTION

This introductory section discusses the importance of expanding knowledge about the health and psychosocial characteristics of adults with depressive disorders receiving integrated primary and behavioral health care (PBHC) services in community mental health (CMH) settings. The scope of the problem of SMI and associated comorbidities is discussed. The relevance of the biopsychosocial perspective and social support theory for understanding the problem is described. This introductory section concludes with a discussion of the importance of research on adults with SMI to the social work profession.

Problem Statement

Little is known about the health and psychosocial characteristics of individuals with SMI, and in particular, MDD in CMH settings. The purpose of this research study is to examine the sociodemographic, psychosocial, health, and health risk characteristics of adults with depression enrolled in an integrated PBHC program. Of particular interest are the interrelationships among the major psychosocial and health-related variables of interest, with emphasis on participants' level of social support. The current study examined differences in social support across certain sociodemographic, health, and health risk characteristics.

Importance of the Problem

It has been well documented that persons with SMI in CMH settings are a vulnerable population that experiences health disparities and excess mortality (De Hert et al., 2011). This social welfare issue has an extremely high cost, with consequences not only to the individuals, but also to their families and to the communities in which they live. Individuals with SMI in CMH settings are prone to negative outcomes, including poor overall physical and psychological health (Druss, Rohrbaugh, Levinson, & Rosenheck, 2001; Druss et al., 2010; Kilbourne et al.,

2008; Woltmann et al., 2012). Families and loved ones of persons with SMI often are negatively affected by financial consequences associated with the cost of treatment (Kennedy, 2013). Communities are also negatively impacted when the needs of persons with SMI are not properly met, which results in more frequent hospitalizations, emergency room visits, and incarcerations (Kennedy, 2013).

Scope of the Problem

According to the Substance Abuse and Mental Health Services Administration (SAMHSA; 2013) the issue of SMI affects approximately 13.6 million adults and includes both thought (schizophrenia, schizoaffective) and mood disorders (major depressive and bipolar disorders). The National Association of State Mental Health Program Directors (NASMHPD) issued a report in 2006 showing that individuals with SMI have significantly higher morbidity rates and a life expectancy averaging 25 years less than the general population (Parks, Svendsen, Singer, & Foti, 2006). Persons with SMI are at a greater risk for comorbidity than the general population because they have a much higher incidence of medical complications due to cardiometabolic disorders (i.e. diabetes, hypertension, and cardiopulmonary disease), health-risk behaviors (e.g. smoking), and more sedentary lifestyles (Druss & von Esenwein, 2005; Jones et. al., 2004). The National Institute of Mental Health (NIMH) estimates the prevalence of medical comorbidity in people with SMI to be approximately 68%, though other sources place that percentage significantly higher (Kessler, Berglund, Demler, Jin, & Walters, 2005).

Medical comorbidity among CMH clients is prevalent. For example, national cardiometabolic screening program indicated that 37% of CMH clients reported high cholesterol, 36% reported hypertension, and 17% had been diagnosed with diabetes (Correll et al., 2010). There is substantial evidence that CMH clients are not screened for cardiometabolic risk factors

and that chronic diseases (e.g. diabetes, hypertension) are neither properly diagnosed nor treated (De Hert et al., 2011). Further, the national cardometabolic screening program showed that individuals who were receiving treatment for their medical conditions at CMH centers continued to have anomalous laboratory results, suggesting that even those who are involved with a healthcare provider may experience high rates of insufficient or improper treatment of their primary healthcare needs (Correll et al., 2010).

Racial and ethnic minorities are especially vulnerable subgroups of the population with SMI with regard to inequities in obtaining high quality physical and behavioral health services (Sanchez, Chapa, Ybarra, & Martinez, 2012). Disparities in access to health care and treatment exacerbate poor health outcomes for persons with SMI (Druss & Walker, 2011). Recently there has been a national focus seeking to reduce and eliminate these disparities, and one such way is an increased effort to integrate models of care. With this current shift, it is necessary for social workers and other behavioral and primary health care providers to incorporate culturally competent approaches to enhance the quality of care and help bridge the gap for particularly disenfranchised subgroups (Sanchez et al., 2012; Williams, Chapa & Des Marais, 2012). The quality of healthcare provided to persons with SMI is affected by multiple factors. Primary and behavioral health care providers often lack the expertise and resources to detect common comorbid disorders (Druss & Walker, 2011). In addition to stigma, persons with SMI have limited heath literacy skills and may experience symptoms that make it difficult for them to advocate for the services they require (Druss et al., 2010). These latter barriers to services are exacerbated by the current health care system, which is disintegrated. As a result, individuals with comorbidities must seek treatment from several different providers in multiple settings to receive the care they need (Parks et al., 2006). Druss and Walker (2011) define integrated health

care as multiple approaches that connect the medical and behavioral health systems of care. Integrated PBHC models are characterized by increased communication and collaboration among multidisciplinary providers that enables more effective prevention and management of comorbid conditions (Druss & Walker, 2011).

The National Institute of Mental Health (NIMH) defines SMI disorders as any mental, behavioral, or emotional disorder not resulting from a developmental or substance use disorder that causes serious functional impairment and typically include schizophrenia, schizoaffective, bipolar, and other mood disorders (NIMH, 2014). Mood disorders are a group of diagnoses including major depressive disorder, dysthymia, mania, hypomania, bipolar I, bipolar II, and cyclothymia (American Psychiatric Association, 2013). In the United States, approximately 9.5% of the adult population is affected by a mood disorder annually, with a lifetime prevalence of 20.8% (Kessler, Berglund, et al., 2005). Of those with a mood disorder, 45% are classified as *severe* (Kessler, Berglund, et al., 2005). In regards to gender, females are 50% more likely than men to have a mood disorder over their lifetime (Kessler et. al., 2005). In terms of race, Blacks are 40% less likely and Hispanics are 20% less likely than Whites to experience a mood disorder over their lifetime (Kessler et. al., 2005). Across socioeconomic status, data show approximately 3.5% of those living at 400% or higher above the poverty level experience depression, and this rate increases to 5% at 200-399% above the poverty level, to 10.5% at 100-199% above the poverty level, and to 16.75% either at or below 100% of the poverty level (Centers for Disease Control and Prevention; CDC, 2011). Further, over half of people who complete suicide (60%) experienced depression or another mood disorder (Kessler, Berglund, et al., 2005).

Medicaid, which is the largest source of funding for medical and health-related services for individuals with low income and limited resources, showed data indicating that over 50% of

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recipients were diagnosed with a chronic medical condition (i.e. diabetes, cardiovascular disease, or pulmonary disease) and that those who utilized the most services were most likely to be diagnosed with a mood disorder (CDC, 2011). DeHert et al. (2011) examined the individual diagnoses comprising SMI and found that individuals with depression were 2.5 times more likely to experience a cardiovascular event and that both depression and bipolar disorder were associated with lower bone marrow density. Druss et al. (2010) found that an additional reason for the high prevalence of comorbid disorders among adults with SMI is inadequate access to preventative health care. For example, research has shown that only half of individuals with a mood disorder actually receive treatment (50.9%) and among those receiving treatment, only 38.5% receive minimally adequate services (Wang et al., 2005). The typical treatment for mood disorders involves therapy, medications, or both. Behavior therapy, cognitive-behavioral therapy, and interpersonal therapy have all been demonstrated to be effective in treating depression (Weston & Morrison, 2001). Medications for mood disorders vary depending on the diagnosis, with MDD most commonly treated with antidepressants (e.g. selective serotonin reuptake inhibitors) and bipolar disorder most commonly treated with mood stabilizers (e.g. lithium and antipsychotics; Weston & Morrison, 2001). Depression is the leading global cause of disability and the most well known and researched of all mood disorders (World Health Organization; WHO, 2012); thus, MDD is the primary focus of the study.

Theoretical Significance

The study is anchored in the biopsychosocial (BPS) model, which is a useful framework for understanding the characteristics of adults receiving integrated care in CMH settings. The BPS model originated in 1977 with psychiatrist George L. Engel and it postulates that a person's well-being is inherently connected to biological, psychological, and sociological factors. The

BPS model posits that the most effective approach when working with an individual is a holistic one that accounts for the full spectrum of these factors (Engel, 1977). Individuals affected by SMI often have numerous physical and behavioral health care conditions that are inherently linked by complex and bidirectional pathways (Druss & Walker, 2011). The BPS model, with its emphasis on interconnectedness of multiple factors, provides a solid theoretical foundation for this descriptive study.

The other framework that anchors the study is the social support theory. Social support is the aid that a social network of connections to individuals and the community provide to a person (Martínez-Hernáez et al., 2016). Research on social support can be traced as far back as Barnes' (1954) study emphasizing the importance of interpersonal relationships not related to family or work. Cassel (1974) was the first researcher to empirically link social support and host resistance, spawning numerous studies that examined the relationship between social support and health. Currently, it is widely accepted that social support serves as a protective factor against stressful events in life as well as enhances psychological well-being (Glanz, Rimer, & Lewis, 2002). Studies of social support have demonstrated that in the general population, social support functions as a safeguard against stress resulting in improved mental health (Cohen, 2001; Cohen, Doyle, Turner, Alper, & Skoner, 2003). SAMHSA (2012) identified social networks that contribute friendship, love, and hope as a significant part of recovery from mental illness. Social support is such an important factor in mental health that clinical practice guidelines now incorporate a social support assessment as part of psychiatric evaluation (Lehman & Steinwachs, 2010).

Contributions to the Current Research

Social workers constitute a vital part of the mental health workforce, functioning in various capacities in both outpatient and inpatient settings (National Association of Social Workers; NASW, 2011). This study is important to the profession because historically social work has embraced a biopsychosocial approach to enhancing the well-being of vulnerable and oppressed populations (NASW, 2008). Integrated PBHC programs are a relatively new arrangement for delivering health care services, and the study developed knowledge about a specific subpopulation of CMH clients with SMI, namely those with MDD. Although few preliminary exploratory studies have sought to describe the health and psychosocial characteristics of CMH clients with SMI (e.g., Druss et al., 2001), this study aims to examine interrelationships among adults with MDD, a subpopulation of clients with high rates of comorbidity (CDC, 2011). Although there is an abundance of research conducted with CMH clients with MDD, no studies have examined those enrolled in integrated PBHC programs.

CHAPTER 2: REVIEW OF THE LITERATURE

This chapter reviews the current state of the knowledge regarding the health characteristics of adults with SMI, with particular emphasis on individuals with MDD. This includes an examination of previous empirical investigations, including seminal studies in the area. This section concludes with a summary and implications of the literature review.

MDD and Physical Health

According to NIMH (2014), an estimated 13.6 million individuals in the U.S. are diagnosed with a SMI, and 20.8% are affected by a mood disorder in their lifetime. A mood disorder is a group of diagnoses in the Diagnostic and Statistical Manual of Mental Disorders (DSM) classification system where an individual's mood is considered to be the predominant underlying feature (American Psychiatric Association; APA, 2013). This classification can be divided into three groups: *elevated mood* with the diagnoses of mania or hypomania; *depressed mood* with the diagnosis of major depressive disorder (MDD) and the similar chronic but milder form, dysthymic disorder; and lastly, *cycling moods,* such as bipolar disorder and cyclothymic disorder (APA, 2013). Depression can be described as a pervasive and persistent low mood accompanied by low self-esteem and loss of interest in typically pleasurable activities, which results in decreased functioning and quality of life (APA, 2013). According to the APA (2013), MDD is characterized by symptoms lasting for at least a two-week period, which cause clinically significant impairment in functioning and cannot be explained by the physiological effects of a substance or any other condition. The symptoms of depression include sadness, hopelessness, loss of interest in activities, changes in weight and sleep patterns, and suicidal ideation (APA, 2013). Additional symptoms may include change in appetite, observable retardation or agitation

of psychomotor activity, anergia, feelings of worthlessness or abnormal feelings of guilt, and lack of concentration or indecisiveness (APA, 2013).

Researchers have sought to understand the complex relationships between physical and mental health because individuals suffering from a medical disorder have a 41% increased risk of having any psychiatric disorder (Kessler, Chiu, et al., 2005). Studies of patients with MDD suggest multiple causal pathways, as follows: a depressive episode is a risk factor for developing some specific chronic health conditions, MDD is a reaction secondary to the development of chronic health conditions, the negative symptoms of a health condition, or the side effects of medications used for treatment of a health condition; and lastly, that a health condition has a direct or indirect physiological effect on the brain (e.g. stroke, increased cytokine levels due to inflammation; Katon, 2003; Konsman et al., 2002). Generally, the more physical symptoms a patient experiences, the higher the levels of depressive symptoms (Kroente et al., 1994). Studies by Celano and Huffman (2011), Frasure-Smith and Lesperance (2008), Gerritis et al. (2014), and IIgen et al. (2008) have all shown that patients with chronic medical conditions, (i.e. cardiovascular disease, diabetes, and chronic pain) experience higher rates of MDD. Furthermore, compared to depressed patients without medical problems, not only is depression more prevalent in those with medical problems, but depressive symptoms are experienced with greater severity, as evidenced by a longer duration and increased suicidality (Koike et al. 2002; Yates et. al. 2004). The documented robust association between chronic medical conditions and MDD has given rise to extensive epidemiological research in patients with specific illnesses, namely heart disease and diabetes. The results of meta-analyses, for example, have shown that patients with diabetes are twice as likely as non-diabetics to have MDD; and that a history of MDD doubles the risk of developing type 2 diabetes over the course of a lifetime (Anderson et

al., 2001; Eaton et al., 1996; Kawakami et al., 1999). An additional meta-analysis showed that MDD increases the risk of developing coronary artery disease by 1.64 times (Rugulies, 2002).

Risk Factors

Katon (2003) found that MDD is also associated with biobehavioral risk factors like overeating, sedentary lifestyle, and smoking. These latter behaviors are linked to a higher incidence of chronic health conditions like obesity, diabetes and heart disease (Goodman & Whitaker 2002; Roseal et al., 2001). Treatment of chronic health conditions typically involves managing the condition through diet, exercise, taking medications as prescribed, and decreasing health-risk behaviors such as drinking alcohol and smoking (Roseal et al., 2001). Dimatteo et al. (2000) showed that medically ill patients with MDD were three times more likely to not adhere to treatment recommendations than those without MDD; a finding that is consistent with those of other studies. For example, many patients with MDD and diabetes do not adhere to diet and consistently refill hypoglycemic medications, patients with MDD and heart disease fail to take aspirin daily, and patients with MDD who smoke often relapse (Anda et al., 1990; Blumenthal et al., 1982; Carney et al., 1995).

Relationship of MDD to physical symptoms and resulting functional impairment

A large body of research has demonstrated the interconnectedness of depression and physical health. For example, Kroneke et al. (1994) explored the correlation between MDD and chronic health conditions and found that as medical symptoms increased, so did the proportion of primary care patients who met criteria for depressive disorders. Individuals with chronic illness must cope with the negative symptoms (e.g. pain, fatigue) they experience, however depression interferes with one's ability to properly manage the symptoms of a chronic illness (Katon et al., 1990). Further, this latter study showed that those with depression are more likely to report more

severe physical symptoms and more symptoms with unidentified pathology than those without a chronic illness (Katon et al., 1990). Wells et al. (1989) found that patients with MDD reported greater levels of occupational, social, and physical impairment, and when depression was comorbid with a chronic medical illness, the level of impairment was amplified. Kessler et al. (2001) showed that having three or more medical and psychiatric comorbidities was positively associated with increased work-loss days at a rate significantly greater than the sum of each individual illness. Moreover, numerous longitudinal studies show that depression and anxiety are more predictive of functional impairment and decreased quality of life, over time, than the severity of physical illness (Sullivan et al., 1997, 2000).

A meta-analysis of 61 studies of depression and chronic illness showed a positive relationship between MDD and mortality in 72% of the investigations, with most identifying cardiovascular disease and the risk of developing coronary artery disease as the primary factor (Ferketich et al., 2000). The mortality rate of patients hospitalized with myocardial infarction who had MDD was four times greater than those without MDD (Frasure-Smith et al., 1993). Research has isolated both biological and behavioral factors that could influence the development of depression after myocardial infarction. Biological factors include decreased heart rate variability (Gorman & Sloan, 2000), increased platelet aggregation (Blumenthal et al., 1982), and higher amounts of inflammatory markers (Anda et al., 1990). Behavioral reasons that could influence the development of MDD among cardiac patients include lack of consistency in adhering to lifestyle changes such as diet, exercise, and taking medications as prescribed (Miller et al., 2002, Musselman et al., 1996). The findings of numerous studies converge to show that comorbid MDD and chronic health conditions result in functional impairment, poorer outcomes, and higher costs.

Costs of comorbid MDD and chronic health conditions

Large-scale studies show that primary care patients have significantly greater medical costs when they have been diagnosed with MDD (Unützer et al., 1997). The cost accumulates across treatment settings, including primary care and specialty, mental health, emergency room and inpatient settings; as well as with other costs associated with pharmaceuticals, laboratory tests, and x-rays (Callahan et al., 1994). Simon et al. (1995) demonstrated that primary care patients with a diagnosis of depression incurred a 50% greater cost than those without a diagnosis of depression. In a similar vein, Ciechanowshi et al. (2000) assigned a sample of diabetics to low-, medium-and high-depression categories based on depression scores on the Hopkin's Symptom Checklist and these authors concluded that there was a direct relationship between severity of depression and total cost on healthcare even after adjusting for severity of diabetes and medical comorbidity. Sullivan et al. (2002) found that patients with congestive heart failure incurred 26-29% higher costs than patients without a diagnosis of depression. Research shows that over half of patients who are high utilizers of medical care report having serious psychological distress, and among distressed patients, over two thirds experience recurrent major depressive episodes (Katon et al, 1990). Moreover, over two thirds of distressed patients also had at least one chronic medical illness, further evidence of the steep rate of comorbidity in the high-utilizing primary care population (Katon et al., 1990). Levenson et al. (1990) and Saravay et al. (1996) both found that patients in the inpatient medical and surgical population showed considerably longer stays when diagnosed with MDD than those not diagnosed. Allison et al. (1995) also studied hospitalization, but specifically among cardiac rehabilitation patients, and concluded that depression significantly increased the rate of rehospitalization.

Integrated PBHC Approaches: Definition and Evaluation

Recent literature has shown that integrated healthcare programs are a promising approach for managing comorbid health conditions and mental illness. Integrated care has been previously described as a continuum of care consisting of three main categories: coordinated, co-located, and integrated (Heath, Wise, Romero, Reynolds, 2013). Heath et al (2013) describe care as being coordinated when healthcare providers function in separate systems with minimal collaboration; whereas care is co-located when providers are in close proximity, frequently communicate, and engage in teamwork. Integrated care takes the approach that no one provider or discipline takes precedence or dominates the delivery of services; integration is seamless and decreases complexity for clients (Heath et al., 2013). An example of fully integrated PBHC would be an organization like the Veterans Affairs, which has the capacity to give clients the full range of behavioral and medical services within the same place. However, the reality is that most CMH organizations do not have resources to develop fully integrated practices (Druss et al., 2010). Given this fact, in the public sector, co-locating behavioral health providers in primary care settings, and co-locating primary care providers in CMH organizations are collaborative care approaches that could potentially achieve clinical integration of PBHC services (Druss & Walker, 2011).

Primary care settings typically treat individuals with the most prevalent mental disorders like depression and anxiety (Wang et al., 2006). Conversely, individuals with SMI typically access health care at a CMH agency (Druss et al., 2008). Woltmann et al. (2012) demonstrated in a meta-analysis of 78 studies that individuals with depression and anxiety achieve superior outcomes when interventions use collaborative care approaches. This type of collaborative care approach uses a multidisciplinary team to improve management of chronic conditions that

require ongoing care (Woltmann et al., 2012). The use of care managers who monitor patient progress, support patient decision making, enable multidisciplinary communication, and provide follow-up care is a key attribute of collaborative care (Unützer et al., 2013).

A care management approach affords a degree of flexibility wherein treatment services are provided based on whether certain measurable objective outcomes are being accomplished (e.g., identified clinical targets like depressive symptoms; Unützer et al., 2013). There are few well-controlled studies that have tested interventions for improving the health of individuals with SMI (Druss et al. 2001; Kilbourne et al. 2008) The Primary Care and Evaluation (PCARE) study is the only randomized trial that has been conducted with clients (N=407) receiving treatment in a CMH setting (Druss et al., 2010). These studies showed that an integrated approach to treating individuals with SMI significantly reduced cardiovascular risk factors (Druss et al., 2010; Kilbourne et al., 2008). The PCARE study is a seminal investigation that tested the effectiveness of an evidence-based care management intervention that aimed to improve access to primary care and health-related quality of life (Druss et al., 2010). Results provided evidence that care managers improved preventative and primary care for participants receiving the integrated care intervention after one year (N=205), as compared to those in the control care group (N=202) as evidenced by decreased cardiovascular risk factors, increased identification of previously undiagnosed conditions, and improvements on measures of mental health, general health, and social functioning (Druss et al., 2010). There are no outcome studies on the social work literature. Horevitz and Manoleas (2013) focused on the assessment of interdisciplinary collaboration between health professionals and social workers, but neglected to investigate characteristics of individuals receiving services. Nover (2013) and Shor and Shaler (2013) utilized participant satisfaction measures in small-scale preliminary wellness projects. Lemieux,

Richards, Hunter, and Kasofsky (2015) examined primary and behavioral health characteristics of 125 CMH clients.

Physical Health Characteristics of Persons with SMI

Five cardiometabolic conditions are associated with the development of diabetes, heart disease, and stroke in both the general population and individuals with SMI: obesity, hypertension, high triglyceride (TRI) levels, elevated blood sugar, and reduced high-density lipoprotein (HDL) (De Hert et al., 2011). According to De Hert et al. (2011), these five conditions also predict cardiovascular disease (CVD), cardiovascular events, and death. Screening for these cardiometabolic conditions has reduced mortality in the general population and is recommended for all individuals with SMI (De Hert et al., 2011), and specifically for persons taking second-generation antipsychotics (Correll et al., 2010; Parks, Radke, & Mazade, 2008). Systematically tracking cardiometabolic risk indicators (viz. height, weight, Body Mass Index (BMI), blood pressure (BP), blood glucose, cholesterol and lipid levels) has been shown to be an effective way of monitoring the physical health of individuals with SMI (Parks et al., 2006; 2008). Established clinical criteria have been established by major health organizations, such as the World Health Organization (WHO), American Heart Association (AHA) and the National Cholesterol Education Program, and disseminated by the SAMHSA-Health Resources and Services Administration (HRSA), Center for Integrated Health Solutions (CIHS). These latter criteria define elevated systolic BP at ≥ 130 and elevated diastolic BP at ≥ 85 (CIHS, 2013). Elevated BP has been shown to increase risk of cardiovascular disease, stroke, and hypertension (Parks et al., 2008). BMI is calculated using measures of height and weight. A BMI of 24 and below corresponds to normal weight, 25-29 indicates overweight, and 39 and higher indicates obesity. Having a BMI falling in the obese range has been strongly associated with higher rates

of type 2 diabetes, heart disease, stroke, hypertension, and premature death (Parks et al., 2008).

Both the American Diabetes Association (ADA) and American Psychiatric Association (APA) have established the guideline that laboratory health indicators (viz. blood glucose and lipid levels) of persons with SMI should be monitored routinely (Parks et al., 2008). The clinical cut-off scores of TRI is ≥150mg/dl, LDL is ≥130mg/dl, HDL is <40mg/dl in men and <50mg/dl in women, and fasting glucose is ≥100mg/dl. According to Parks et al. (2008), reducing TRI and LDL levels is associated with a decreased risk of developing diabetes, CVD, and obesity. Further, increasing HDL is also associated with the beneficial health outcomes of lowering total cholesterol and weight (Parks et al., 2008). The aforementioned health indicator data has been primarily used to confirm self-reported chronic conditions and to evaluate the level of care (Druss et al., 2010). Parks et al. (2008) summarized data from multiple state-level studies and also emphasized the importance of collecting information about family history of cardiometabolic diseases, in addition to personal medical information, because family history is a risk factor for developing comorbid conditions.

Health-risk behaviors such as tobacco, alcohol, and other substance use are more prevalent in individuals with SMI than in the general population (Parks et al., 2006). Accordingly, Parks et al. (2010) recommended collecting substance use data from all individuals receiving mental health care, including tobacco, alcohol, and other substances. The epidemiological study of individuals with SMI conducted by Hartz et al. (2014) established that roughly 75% of individuals with SMI were regular smokers, as compared to 33% of the general population. This latter study also found that binge drinking occurred in individuals with SMI at a rate (30%) over three times that of the general population (8%), and that half of the individuals with SMI regularly used marijuana and other illicit drugs, whereas only 18% of the

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general population used marijuana and only 12% used other illicit drugs (Hartz et al., 2014). Druss et al. (2010) reported that nearly one-fourth of the participants was diagnosed with a co-occurring substance use disorder (25.7%).

In terms of gender differences, Lemieux et al.'s (2015) descriptive study of individuals with SMI receiving integrated PBHC in CMH settings showed that the average number of comorbid conditions was significantly higher for women than men (at 86 and 53, respectively). In addition, over 4 times as many women than men reported comorbid cardiac disease (Lemieux et al., 2015). Both men and women had mean systolic BP, BMI, blood glucose, and LDL scores that surpassed the at-risk cut-off scores (Lemieux et al., 2015). Gleason et al. (2014) specifically examined gender and found no significant differences in health indicators between men and women receiving integrated PBHC services. With regard to racial differences, Lemieux et al. (2015) found that the mean BMI scores surpassed the recommended at-risk cutoff for Blacks and Whites, however, systolic BP was significantly higher for Blacks than Whites. In regards to family history, those who reported a family history of hypertension had significantly higher diastolic BP and total lipid scores than those who did not (Lemieux et al., 2015). The mean total lipid score was significantly higher and in the at-risk range for those who reported a family history of diabetes, as compared to those reporting no family history (Lemieux et al, 2015).

Social Support: Definition and Implications for Health

Social support is defined as assistance provided to individuals by persons who comprise their social network (Martínez-Hernáez et al., 2016). Martínez-Hernáez et al. (2016) further defined social network as a collection of social ties of varying number, intensity and frequency of contact with individuals and community. Social support has also been categorized as perceived, received, emotional, and instrumental (Martínez-Hernáez, 2016). Perceived support is

the support an individual personally regards as assistance, whereas received support is the actual measurable assistance received by the individual (e.g. financial; Martínez-Hernáez, 2016). Emotional support is the sharing of thoughts and feelings with a member of the social network who is seen as a confidante, and lastly, instrumental support consists of members of the social network who assist the individual with tasks (e.g. activities of daily living; Martínez-Hernáez et al, 2016). Social support is a well-studied construct that had been demonstrated to provide a multitude of potential benefits, both physical and psychological.

In terms of physical health, social support has been associated with better immune function and decreased inflammation; as well as lower cortisol levels, blood pressure, and heart rates in the general population (Uchino 2006; 2009). Psychologically, social support enhances mental health and well-being by reducing anxiety and depression during stressful life adjustments (Uchino, 2006). Uchino (2006; 2009) reviewed literature describing how social support functions to ameliorate psychological and physical distress in one of two ways: Social support enables problem solving through the provision of direct feedback from others, and social support serves to increase emotional regulation. Conversely, lower levels of social support are associated with higher levels of suicidal ideation and substance abuse (Uchino, 2009). Current research on social support has shown support for two prevailing hypotheses: the buffering hypothesis and the direct effects hypothesis (Taylor, 2011). The buffering hypothesis posits that social support safeguards individuals from the negative effects of major life events (i.e. stress, grief) and that social support is mainly beneficial during those times (Taylor, 2011). Support for the buffering hypothesis was demonstrated by Taylor (2011) who showed that the correlation between distressing life transitions and poor psychological and physical outcomes was weakened with increased social support and strengthened with decreased social support. The direct effects

hypothesis, on the other hand, surmises that social support is beneficial throughout one's life and that those with higher social support are generally in better, overall physical and psychological health (Taylor, 2011).

Social connectedness is a social determinant of health (Stansfeld, 2006). Roessler (2006) identifies social connectedness as a critical factor in sustained recovery among individuals with SMI. It is so fundamental that information about social supports and support for recovery is classified as a key health indicator in the NASMHPD guidelines for adults receiving mental health services (Parks et al., 2008). However, there is only limited research to date offering insight into the function of social support in the SMI population. Chronister et al (2015) postulates that inconclusive results of previous studies are due to the use of measures of social support that are intended for the general population, which overlook the unique kinds of support most relevant to individuals with SMI. Indeed, persons with SMI experience stressors that are distinct from those experienced by the general population (e.g., unemployment), such as stigma, isolation, and chronic health issues (Chronister et al., 2015). Recent research has focused on developing measures of social support that are specific to certain populations. For example, McCormack et al. (2008) developed a measure of social support relevant to individuals with diabetes. Chronister et al. (2015) recruited 52 individuals with SMI receiving CMH services in the San Francisco Bay Area to participate in a series of focus groups. The results of the focus groups yielded six domains of social support salient to individuals with SMI: supportive conditions (e.g., opportunities to interact with accepting and respectful individuals), day-to-day living (e.g., ADL and transportation), illness management (e.g., medication adherence and symptom management), resources and information (e.g., obtaining housing, legal, and vocational assistance), guidance and advice (e.g. direct feedback and suggestions), and community

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participation (e.g., opportunities for recreation, leisure, and friendships; Chronister et al., 2015). Although small in scope, the study by Chronister et al. (2015) emphasizes the multidimensionality of social support for persons with SMI.

Little is known about the social support of individuals with comorbid disorders receiving integrated healthcare. Druss and Walker (2011) and Pratt et al. (2008) employed a conceptual model that prioritized the interconnectedness of general physical health, psychosocial functioning, and supportive settings. Kobau and Zack (2013) conducted a large-scale epidemiological study and found that individuals with chronic comorbid conditions were at a greater risk of worse health outcomes than those without either a mental or physical condition, largely because of stigma and social isolation. Nover's (2013) qualitative study of clients obtaining care management services in a medical setting found that participants viewed social support provided by the clinicians to be a favorable and valuable aspect of the program. As a result, Nover (2013) recommended that researchers distinguish between social support provided by professional staff from the social support that exists in the social networks of clients in CMH settings.

Summary and Implications of Literature Review

Research conducted by Druss et al. (2010) and Unützer et al. (2013) provides evidence that individuals with SMI can best have their healthcare needs met by a care management approach that promotes access to primary care services. The results of numerous studies suggest that integrated PBHC approaches are associated with improved outcomes, including medical care utilization, clinical symptomology, and reductions in health risk behaviors (Druss et al., 2001; Druss & von Esenwein, 2005; Mueser et al., 2010; Woltmann et al., 2012). These latter studies have expanded the knowledge base about the benefits of integrated approaches with persons with

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SMI. Nevertheless, additional correlational research is needed to describe the characteristics of this population, as CMH agencies increasingly incorporate collaborative care models within their organizations (Lemieux et al., 2015). Of particular interest is the subpopulation of clients with MDD, who are at considerable risk of experiencing a comorbid chronic illness (Celano & Huffman 2011; Frasure-Smith & Lesperance, 2008; Gerritis et al., 2014; IIgen et al., 2008) and poor health outcomes (Anda et al., 1990; Blumenthal et al., 1982; Frasure-Smith et al., 1993). Clients with MDD were overrepresented in the study by Lemieux et al. (2015).

A large body of research has identified a multitude of biopsychosocial risk factors for comorbid MDD and chronic medical conditions that increase morbidity and mortality (De Hert et al., 2011). However, no study to date has examined the health and psychosocial characteristics of clients with MDD receiving integrated PBHC services. MDD is a chronic, debilitating condition that is empirically linked to poorer health, psychological distress, and impaired daily functioning (Allen et al., 2000). Large-scale studies undertaken with the general population show that social support acts as a buffer for individuals with physical health conditions, reducing the likelihood of depression, while increasing positive coping (Allen et al., 2000). The study seeks to expand knowledge about clients with MDD in integrated health programs, an area that is consistent with the biopsychosocial perspective.

CHAPTER 3: CONCEPTUAL FRAMEWORK

This section summarizes the purpose of this research study, concisely list the research questions that are investigated, and define key terms relevant to the study.

Purpose

The exploratory-descriptive, cross-sectional study seeks to examine the interrelationships among physical health, health-risk behaviors, and psychosocial characteristics of individuals with MDD receiving integrated PBHC in CMH settings. This study utilized existing data collected from clients enrolled in an integrated PBHC program at 3 CMH sites in a southern state.

Research Questions

The study is framed by the following questions:

1.) What are the sociodemographic, health, health-risk, and psychosocial characteristics of adults with MDD enrolled in an integrated health care program?

2.) Are there differences in social support across sociodemographic (age, gender, race, education level, employment status, disability status), health (personal and family history of diabetes, high blood pressure, heart disease), and health-risk characteristics (personal history of tobacco, alcohol, and substance use)?

3.) What are the interrelationships among social support, socdiodemographic (age, gender, race), health (health indicator scores, overall health), and psychosocial characteristics (level of functioning, psychological distress) among adults with MDD in an integrated PBHC program?

Key Terms

This section defines key terms used in the study research questions. Instrumentation used to measure these concepts is described in greater detail in the Methodology section below.

Sociodemographic characteristics include age, gender, race, education level, employment status, and disability status. Age is defined as respondents' self-reported age at the time of admission. Gender is self-reported as either male or female at the time of admission. Education level is defined as participants' highest attainment of schooling at the time of admission. Employment status refers to whether the participant is employed or unemployed at the time of admission. The response options include 2 categories of employment (full time and part time) and 5 categories of unemployment (looking for work, disabled, volunteer work, retired, and not looking for work). Disability status is a variable that was created from one of the self-reported response options for the reason for unemployment. This item was be recoded as either yes (1) or no (0).

Health characteristics refer to participants' health indicator scores, overall health, and personal and family history of cardiometabolic disorders (i.e., diabetes, hypertension, and cardiac disease). Health indicators consist of mechanical and laboratory health indicator scores. Overall health is defined as the level of overall health self-reported at the time of admission. Personal history of cardiometabolic disorders is defined as participants' self-reports about having diabetes, hypertension, or cardiac disease. Family history of cardiometabolic disorders refers to a positive family history of diabetes, high blood pressure, and cardiac problems, and is self-reported by participants. Health-risk behaviors are defined as participants' self-reported use of tobacco, alcohol, and other substances.

Psychosocial characteristics include social support, level of functioning, and psychological distress. Social support is defined as participants' perceived support in interpersonal relationships, and is measured with a 4-item scale assessing participants' social connectedness, social networks, and perceived social support. Level of functioning refers to participants' self-assessed day-to-day functioning and is measured with an 8-item scale focusing on different areas of living (e.g., family, social situations, housing). Level of functioning is defined as the total scale score of the 8-item Perception of Functioning Scale. Psychological distress is defined as participant's self-report of symptomology, including nervousness, hopelessness, and feelings of sadness and worthlessness (Kessler et al., 2010).

CHAPTER 4: METHODOLOGY

This section describes the sample and protection of human subjects. The procedures are described, including information about instrumentation and data analysis.

Sample

The cross-sectional study utilized data collected from 407 participants with MDD receiving integrated PBHC services at 3 CMH sites between February 2012 and August 2015 at a publicly funded agency in Louisiana. The population the agency serves is socioeconomically underprivileged individuals who either have no health insurance or receive public benefits (Lemieux et al., 2015). The sample (N=407) for the study is a subsample of 1270 participants with SMI diagnosed with MDD (32.3%) upon admission to the Integrated Health Program (IHP). The mean age of participants in the study is 45.6 (SD=11.2) and the sample consists primarily of women (N=305, 75.5%).

Original Study

Based on Unützer et al.'s (2013) framework of integrated care, the IHP utilized a collaborative care approach like that described in the PCARE study (Druss et al., 2010). According to Lemieux et al. (2015), the IHP targeted CMH clients who had either not had an annual physical exam the year prior to admission, could not identify a primary care provider, or had a particular health complaint. The IHP employed a full-time registered nurse to conduct systematic screenings and track participant's health indicators and outcomes, connect participants without a primary care provider to medical care, and refer participants to on-site wellness and preventative services at each of the 3 CMH sites. The IHP nurse care managers executed the tasks of supporting, advocating for, and educating participants.

Informed consent was obtained from participants in the original study upon admission to the IHP program. The data used in the original study did not include identifying information and participants' identities could not be determined. The study posed no more than minimal risk to participants and was exempted from Institutional Review Road oversight by the researcher's affiliated university. The de-identified PBHC services data was collected with the federally mandated National Outcomes Measures Client-level Measures (NOMs) baseline tool and the IHP Baseline Physical Health Indicators Form (IHP-BPHIF) (Lemieux et al., 2015). These two instruments were administered to IHP program participants by the nurse care coordinators upon enrollment. In compliance with HIPPA privacy rules, files containing the data were scanned at each site by researchers and then entered into the SPSS 21 database for statistical analysis (Lemieux et al., 2015).

As reported ay Lemieux et. al. (2015), the NOMs instrument encompasses 6 major sections measuring information about demographics, psychosocial functioning, housing, education and employment, legal history, and social connectedness. This instrument contains the Mental Health Statistics Improvement Program (MHSIP) scale, which was developed by the NASMHPD Research Institute, Behavioral Healthcare Performance Measurement System to gather supplementary health information not measured with the NOMs tool (Jerrell, 2006; Schacht, 2001). As reported by Lemieux et al. (2015), the IHP-BPHIF is composed of 7 major sections that collect information about participants' primary healthcare providers and health insurance, current diagnoses (i.e., primary health, psychiatric disorders, etc.), medications, health indicators, health risk behaviors, and personal and family medical and substance use history.

Intrumentation

Sociodemographic Characteristics

Sociodemographic characteristics were measured with the NOMs tool and include age, gender, race, employment status, education level, and disability status. Participants' age in years upon enrollment was measured with one self-reported item. Information about gender was collected with one self-reported item with 2 response options: Male, Female. Ethnicity information was collected with a single self-report item with 7 response options: Hispanic, African-American, Asian, Pacific-Islander, Alaksa Native, White, and American Indian. One NOMs item collected self-reported information about employment status with two response options for employed (full time or part time) and five response options for unemployed (looking for work, not looking for work, disabled, volunteer work, retired). One NOMs self-report item collected information about participants' educational attainment with the following 6 response options: less than 12th grade, high school or GED, vocational diploma, some college, bachelors, or graduate degree. Disability status was created from the corresponding reason for unemployment, and dichotomized (0=No, 1=Yes). For each of the above items, participants were given an option to refuse providing the information.

Health Characteristics

Health characteristics refers to health indicator scores, overall health, and personal and family history of cardiometabolic disorders.

Health indicator scores. Mechanical and laboratory scores comprised the objective health indicator data that were collected upon enrollment with the IHP-BPHIF form. Mechanical indicators included diastolic and systolic BP and BMI. Laboratory indicators included fasting blood glucose, total cholesterol, LDL, HDL, and TRI scores.

Health-risk behaviors. Health-risk behaviors consisted of participant's use of alcohol, tobacco, and other non-prescribed substances. These behaviors were measured with corresponding 3 self-report items listed on the IHP-BPHIF asking whether participants had a personal history of substance use. Response options for the 3 items were dichotomized in the original study as yes and no.

Overall health. Overall health was measured with one general self-rated health (GSRH) question (DeSalvo, Bloser, Reynolds, He, and Muntner, 2005). For populations at risk of negative health outcomes, including those with comorbid conditions, health researchers recommend using a GSRH to measure self-assessed health status (DeSalvo et al., 2005). Participants' health status was measured with one GSRH item on the NOMs, "How would you rate your overall health right now?" with response options ranging from 1 (poor) to 5 (excellent).

Cardiometabolic disorders. Cardiometabolic disorders included both personal and family history of having one or more of the following conditions: diabetes, high BP, and cardiac problems. Both personal and family history of cardiometabolic disorders were measured with 3 self-report items corresponding to each condition in one section of the IHP-BPHIF. The response options for the 6 items were dichotomized as either yes or no.

Psychosocial Characteristics

Participants's psychosocial characteristics included measures of participants' level of functioning, psychological distress, and social support.

Level of functioning. Respondents' daily functioning was measured with the Perception of Functioning subscale of the MHSIP that is composed of 8 items (Schacht, 2001). Participants rated how well they felt they were able to manage their daily life in the 30 days preceding enrollment in the following areas: daily problems, control, crisis, family, social situations, work

or school (if applicable), housing, and symptoms. Some examples of items include: I deal effectively with problems, I am able to deal with crisis, I do well in school and/or work, and my symptoms are not bothering me. Response options used a Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). The sum of these 8 items yielded a total daily functioning score that ranged from 8 to 40, with higher scores indicative of higher levels of functioning. As reported by Lemieux et al. (2015), Cronbach's alpha for the Perception of Functioning scale was 0.76 indicating adequate reliability for the original study.

Psychological distress. Psychological distress was measured with the clinically valid K6 scale (Kessler et al., 2010). Participants were asked to assess how often during the 30 days preceding admission they felt nervous, hopeless, restless, depressed, worthless, and that everything was an effort. Response options used a Likert scale ranging from 0 (not at all) to 4 (all of the time), with higher scores indicating greater psychological distress (Kessler et al., 2010). The sum of these 6 items yielded a total K6 scale score ranging from 0-24. As reported by Lemieux et. al. (2015), Cronbach's alpha for the K6 scale was 0.88, indicating good reliability for the original study.

Social support. Social support was defined as participants' perceived social support in interpersonal relationships and was measured with the Perception of Social Connectedness (PSC) subscale of the MHSIP (Schacht, 2001). Participants rated how much they agreed with four statements designed to assess how happy they were with their friendships, enjoyed doing things with others, felt as if they belonged in their community, and received support from family and friends when in crisis. The instructions for the PSC specifically asked respondents to reply with regard to their relationships with individuals other than their mental health providers in the 30 days preceding enrollment. Level of social connectedness wass measured with participants level

of agreement with the following statements: I am happy with the friendships I have, I have people with whom I can do enjoyable things, I feel I belong in my community, and in a crisis, I would have the support I need from family or friends. Response options used a Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree), with higher scores indicating higher levels of perceived social support. The sum of these four items yielded a total PSC scale score that ranged from 4-20. As reported by Lemieux et al. (2015), Cronbach's alpha for the PSC scale was 0.81, indicating adequate internal consistency for the original study.

Data Analysis

A power analysis was conducted to confirm that a sample size of 407 is adequate to detect a medium effect size (0.80) with an alpha set at 0.05 (Rubin & Babbie, 1997). Univariate statistics were used to summarize data and bivariate statistics were used to examine associations among variables (Rubin & Babbie, 1997).

To answer research question number one regarding the characteristics of the sample, descriptive statistics for non-parametric variables (e.g., gender, race, health-risk behaviors) were reported using frequencies (n) and corresponding percentages ($\%$). Descriptive statistics for the parametric variables (e.g., age, health indicator scores, overall health) were reported by calculating the mean (x) and standard deviation (σ) (Rubin & Babbie, 1997).

To answer research question number two about differences in social support across relevant variables, t-tests were computed and the statistics that were reported are the t-statistic (t) and the level of significance ($p<0.05$) (Rubin & Babbie, 1997). To address research question number 3 regarding interrelationships, Pearson's product moment correlation coefficient was computed to asses the direction and strength of the relationships among continuous variables (social support, health, and psychosocial characteristics; Rubin & Babbie, 1997).

CHAPTER 5: RESULTS

The present cross-sectional descriptive study examined interrelationships among physical health, health risk factors, psychosocial characteristics, and social support in individuals with MDD receiving integrated PBHC in CMH settings. In the original study these variables were measured at intake at 3 CMH centers using two different tools, the IHP-BPHIF and the NOMs. In terms of statistical power for bivariate analysis, a sample size of 80-100 is recommended for a medium effect size (0.6) at the 0.05 significance level with standard statistical power of 0.83-0.86 (Rubin & Babbie, 1997). Results of a power analysis confirmed that the minimum number of subjects needed was exceeded in the present study ($N = 407$; Rubin & Babbie, 1997).

Descriptive Statistics of Participant Characteristics

Sociodemographic Characteristics

As seen in Table 1, the sample included 305 females (75.5%) and 99 males (24.5%) who were on average 45.6 years of age (SD=11.2, Range=16-75). The sample was roughly proportional with regard to race. Among participants who reported race, 199 were African American (51.2%) and 190 were White (48.8%; See Table 1). With regard to education level, approximately two thirds reported having a high school degree or more ($n=273$, 67.6%) with the remaining third reporting less than a 12th grade education ($n=131$, 32.4%). In terms of employment, just over three fourths of participants were unemployed ($n=307$, 76.8%) and about one fourth were employed ($n=93$, 23.3%). Lastly, in regards to disability status, Table 1 shows that almost five times as many participants were not disabled (83.1%) as were disabled (16.9%).

Table 1-Sociodemographic Characteristics (*N*=389-409)

	M	SD	Range	Frequency (*n*)	Valid Percent
Age	45.6	11.2	16-75	404	-
Gender	-	-	-	404	-
Male	-	-	-	99	24.5
Female	-	-	-	305	75.5
Race	-	-	-	389	-
African-American	-	-	-	199	51.2
White	-	-	-	190	48.8
Education Level	-	-	-	404	-
<12th Grade	-	-	-	131	32.4
≥12th Grade	-	-	-	273	67.6
Employment Status	-	-	-	400	-
Unemployed	-	-	-	307	76.8
Employed	-	-	-	93	23.3
Disability Status	-	-	-	409	-
Not Disabled	-	-	-	340	83.1
Disabled	-	-	-	69	16.9

Health Characteristics

Health characteristics in the current study included health indicator scores, overall health, and personal and family history of cardiometabolic disorders.

Health indicator scores. In terms of specific mechanical and laboratory blood work health indicators, Table 2 provides participants' scores along with the recommended at-risk cut offs (CIHS, 2013). As seen in Table 2, the mean scores for diastolic BP, total lipid, HDL, LDL, and TRI were all within an acceptable range, relative to at-risk cut-off scores. One third or less were at risk on measures of TRI (33.5%) and HDL (29.0%). However, the mean scores for systolic BP, BMI, and blood glucose exceeded the CIHS (2013) recommended cut-off scores (at 133.46, 32.60, and 112.45, respectively). Over half of participants had systolic BP levels that were considered at-risk (56.0%). BMI scores showed an average of 32.6 (*SD*=9.71) and placed about four-fifths of participants (*n*=276, 82.4%) at risk, indicating either overweight or obesity. Table 2 shows that the mean blood glucose levels in the current sample (112.45) exceeded the at-risk cut-off score, placing almost 4 in 10 participants at risk. Considering the health indicators of systolic BP, BMI, and blood glucose, similar proportions of participants were at risk on measures of diastolic BP and LDL (at 39.3%, 39.8%, and 36.0%, respectively). Among all health indicators, the majority of participants were at risk on two measures: systolic BP and BMI (See Table 2).

Overall health. As seen in Table 2, the mean score on the single-item GSRH question assessing how participants viewed their overall health was 2.29 (*SD*=0.95, Range=1-5). This indicates participants generally perceived their overall health as marginally better than fair.

Psychosocial Characteristics

Table 2 shows the mean scores of the scales measuring participants' psychosocial characteristics. The mean Perception of Functioning (PF) total scale score was 21.83 (*SD*=4.67, Range=9-35), indicating moderate levels of perceived daily functioning. As seen in Table 2, the mean K6 total scale score was 12.53 (*SD*=6.10, Range=0-24), indicating moderate levels of psychological distress. The mean PSC total scale score was 14.72 (*SD*=2.94, Range=4-20), indicating moderately high levels of perceived social support (See Table 2). Cronbach's alpha for the PF subscale, K6, and PSC scales was 0.75, 0.87, and 0.77 respectively, indicating adequate internal consistency of each of these scales for participants in the current study.

Health-Risk Characteristics

In terms of health-risk behaviors, Table 3 shows that a slightly greater proportion of participants (*n*=208, 51.7%) used tobacco than did not use tobacco (*n*=194, 48.3%). Almost one third of participants reported using alcohol (*n*=126, 31.5%). As seen in Table 3, almost one fourth of participants reported using other non-prescribed substances (*n*=98, 24.5%)

Participants were asked to self-report if they had a personal and family history of cardiometabolic disorders. Table 3 shows that approximately one fourth of participants reported having diabetes (25.3%) and less than one fifth reported having cardiac problems (16.5%). Over half, however, reported having high blood pressure (53.8%). With regard to having a family history of these latter disorders, the majority reported affirmatively for all three (See Table 3). As seen in Table 3, over four fifths of participants reported a family history of high blood pressure (83.2%), over two thirds report having a family history of diabetes (69.0%) and over half reported a family history of cardiac disease (53.8%).

Table 2-Health Indicators, Overall Health, Psychosocial Characteristics (*N*=335-407)

	M	SD	Range	Frequency (*n*)	Valid Percent
Systolic BP	133.46	20.54	92-213	403	-
Not at-risk	-	-	-	175	44.0
At-risk $\geq$130	-	-	-	228	56.0
Diastolic BP	81.28	12.67	40-120	407	-
Not at-risk	-	-	-	247	60.7
At-risk $\geq$85	-	-	-	160	39.3
BMI	32.60	9.71	15-93	335	-
Not at-risk	-	-	-	59	17.6
At-risk $\geq$25	-	-	-	276	82.4
Blood glucose	112.45	60.98	48-517	369	-
Not at-risk	-	-	-	222	60.2
At-risk $\geq$100	-	-	-	147	39.8
Total lipid	196.01	44.82	72-452	368	-
Not at-risk	-	-	-	205	55.7
At-risk $\geq$200	-	-	-	163	44.3
HDL	50.24	17.66	24-189	366	-
Not at-risk	-	-	-	260	71.0
At-risk <40	-	-	-	106	29.0
LDL	120.75	43.94	27-400	353	-
Not at-risk	-	-	-	226	64.0
At-risk $\geq$ 130	-	-	-	127	36.0
TRI	148.92	176.53	28-3000	361	-
Not at-risk	-	-	-	240	66.5
At-risk $\geq$150	-	-	-	121	33.5
Overall health	2.29	0.95	1-5	394	-
Functioning	21.83	4.67	9-35	400	-
Psychological distress	12.53	6.10	0-24	398	-
Social support	14.72	2.94	4-20	403	-

Table 3-Health-Risk Characteristics (*N*=373-402)

	Frequency (*n*)	Valid Percent
Personal HX: Tobacco	402	-
No	194	48.3
Yes	208	51.7
Personal HX: Alcohol	400	-
No	274	68.5
Yes	126	31.5
Personal HX: Other substance	400	-
No	302	75.5
Yes	98	24.5
Personal HX: Diabetes	375	-
No	280	74.7
Yes	95	25.3
Personal HX: High BP	383	-
No	177	46.2
Yes	206	53.8
Personal HX: Cardiac	381	-
No	318	83.5
Yes	63	16.5
Family HX: Diabetes	378	-
No	117	31.0
Yes	261	69.0
Family HX: High BP	375	-
No	62	16.8
Yes	313	83.2
Family HX: Cardiac	373	-
No	135	36.2
Yes	238	63.8

Differences in Social Support

An independent samples *t* test was performed to compare mean PSC scores (assessing social support) across sociodemographic (gender, race, education level, employment status, disability status) health (personal and family history of diabetes, high blood pressure, heart disease) and health-risk characteristics (personal history of tobacco, alcohol, and substance use). As seen in Table 4, the mean social support score was significantly higher for women (*M*=14.9) than for men (*M*=14.1). The mean social support score was also significantly higher for participants who reported a family history of high blood pressure (*M*=14.9) than for those who did not (*M*=14.0). A subsequent non-parametric analysis showed that this latter finding was due to a significantly greater proportion of women (78.6%) than men (21.4%) reporting a family history of high blood pressure (*Phi*=0.142, *df*=1, *p*<.01). As seen in Table 4, considerable differences emerged between those who used tobacco (*M*=14.5) and to those who did not (*M*=14.9) and between those who used substances (M=14.8) and those who did not (M=14.4); however these latter differences were not statistically significant. There were no other differences in PSC scores across other key characteristics (See Table 4).

Interrelationships among Social Support, Health and Psychosocial Variables

Table 5 shows a correlation matrix that was computed to examine interrelationships among social support, health (health indicator scores, overall health) and psychosocial characteristics (level of functioning, psychological distress). As would be expected, Table 5 shows that numerous significant and moderately strong associations emerged among the 4 lipid indicators (Total lipid, HDL, LDL, and TRI), with values ranging from -0.21 to 0.81 (*p*<.01). Systolic and diastolic BP were also strongly associated (*r*=0.59, *p*<.01). Significant associations emerged among mechanical and laboratory indicators. Blood glucose was positively but weakly

correlated to systolic BP (r=0.21), diastolic BP (r=0.12), and BMI (r=0.14). Diastolic BP was weakly correlated with LDL (r=0.11). and TRI (r=0.15). The final association between mechanical and laboratory indicators was between BMI and HDL (r=-0.17). Age was positively correlated with systolic BP (r=0.23) and with HDL (r=0.20), indicating that systolic BP and HDL scores increased with age. HDL was associated with gender (r=0.27) and race (r=0.22), indicating that female and White participants showed somewhat higher HDL levels.

In examining interrelationships among psychosocial characteristics, numerous significant associations emerged (See Table 5). Total perception of functioning scores were positively and moderately associated with participants' overall health rating (r=0.33) and social support (r=0.47), and negatively and strongly associated with psychological distress (r=-0.69). These results indicate that a perceived higher level of daily functioning was related to higher ratings of overall health and social support, and with lower levels of psychological distress. With regard to psychological distress, K6 scores were negatively correlated with overall health (r=-0.32) and social support (r=-0.36). As psychological distress increased, overall health and perceived social support decreased. Other interrelationships among these variables were weak, ranging from .01-.20 (See Table 5). In sum, four significant correlates of social support emerged: gender (0.11), overall health (0.18), daily functioning (0.47), and psychological distress (-0.36). Higher levels of social support were associated with being female, with better self-assessed health and higher levels of functioning, and with less symptomology. The associations between social support and both daily functioning and psychological distress were moderately low; whereas relationships between social support and both gender and overall health were very low (See Table 5).

Table 4-Differences in Mean Social Support Scores Across Key Characteristics (*N*=367-403)

	Mean	SD	95% CI	*t*	*df*
Sociodemographic Characteristics					
Gender					
Male	14.1	3.4	-	-	-
Female	14.9	2.8	-1.4, -0.1	-2.10*	395
Race					
African-American	14.9	2.8	-	-	-
White	14.7	3.1	-0.8, 0.4	-0.69	380
Education Level					
<12th Grade	14.8	2.8	-	-	-
$\geq$12th Grade	14.7	3.0	-0.6, 0.7	0.16	401
Employment Status					
Unemployed	14.7	2.9	-	-	-
Employed	14.8	3.2	-0.9, 0.5	-0.47	391
Disability Status					
Not disabled	14.7	2.9	-	-	-
Disabled	14.7	3.1	-0.8, 0.8	0.01	400
Health Characteristics					
Personal HX: Diabetes	-	-	-0.6, 0.8	0.36	366
No	14.8	2.9	-	-	-
Yes	14.7	2.8	-	-	-
Personal HX: High BP	-	-	-0.5, 0.6	0.18	374
No	14.8	3.1	-	-	-
Yes	14.7	2.8	-	-	-
Personal HX: Cardiac	-	-	-0.9, 0.7	-0.21	372
No	14.8	3.0	-	-	-
Yes	14.9	2.5	-	-	-
Family HX: Diabetes	-	-	-0.7, 0.6	-0.26	370
No	14.7	3.1	-	-	-
Yes	14.8	2.8	-	-	-
Family HX: High BP	-	-	-1.7, -0.1	-2.31*	367
No	14.0	3.5	-	-	-
Yes	14.9	2.8	-	-	-
Family HX: Cardiac	-	-	-0.6, 0.6	-0.01	365
No	14.8	3.0	-	-	-
Yes	14.8	2.9	-	-	-
Health-Risk Characteristics					
Personal HX: Tobacco	-	-	-0.3, 0.9	1.08	393
No	14.9	2.8	-	-	-
Yes	14.5	3.1	-	-	-
Personal HX: Alcohol	-	-	-0.9, 0.4	-0.71	391
No	14.7	2.9	-	-	-
Yes	14.9	3.0	-	-	-
Personal HX: Other substance	-	-	-0.3, 1.1	1.22	391
No	14.8	3.0	-	-	-
Yes	14.4	2.8	-	-	-

*p<.05, **p<.01.

Table 5-Interrelationships among Social Support, Health, and Psychosocial Characteristics (*N*=292-407)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. Age	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2. Gender	.02	1	-	-	-	-	-	-	-	-	-	-	-	-	-
3. Race	.13*	.05	1	-	-	-	-	-	-	-	-	-	-	-	-
4. Overall Health	-.09	-.00	-.01	1	-	-	-	-	-	-	-	-	-	-	-
5. BP Systolic	.23**	-.09	.15**	-0.8	1	-	-	-	-	-	-	-	-	-	-
6. BP Diastolic	.01	.04	.09	-.10*	.59**	1	-	-	-	-	-	-	-	-	-
7. BMI	-.09	.12*	.16**	-.08	.19**	.19**	1	-	-	-	-	-	-	-	-
8. Blood Glucose	.16**	.01	.04	-.13*	.21**	.12*	.14*	1	-	-	-	-	-	-	-
9. Total Lipid	.19**	.09	-.06	-.03	-.00	.10	-.04	.13*	1	-	-	-	-	-	-
10. HDL	.20**	.27**	.22**	.10	-.07	-.03	-.17**	-.06	.07	1	-	-	-	-	-
11. LDL	.05	.02	-.08	-.09	-.02	.11*	-.01	.14*	.81**	-.19**	1	-	-	-	-
12. TRI	.05	-.13*	-.03	-.08	.08	.15**	.10	.38**	.40**	-.21**	.38**	1	-	-	-
13. Functioning	.05	.00	-.02	.33**	-.05	-.12*	.07	.05	-.08	-.02	-.04	.00	1	-	-
14.Psyc. Distress	.01	.05	.07	-.32**	.11*	.09	-.12*	.01	.01	-.04	-.00	.00	-.69**	1	-
15. Social Support	.06	.11*	.04	.18**	-.04	-.10	.09	.03	-.01	-.00	-.01	.01	.47**	-.36**	1

p < .05, **p* < .01.

CHAPTER 6: DISCUSSION

The current cross-sectional, exploratory-descriptive study utilized an integrated data set

consisting of a sample of 407 participants diagnosed with MDD receiving integrated PBHC

services in CMH settings to analyze interrelationships among physical health, health-risk factors,

psychosocial characteristics, and social support. A main goal of this research was to expand the

burgeoning knowledge base on integrated PBHC services in CMH settings and describe the

health and psychosocial characteristics of participants in such programs. This is critical

information that is underreported in the literature, as research has not kept pace with the

evolution of healthcare delivery. Another goal was to examine the correlates of social support,

specifically in individuals affected by the most prevalent mental health diagnosis, MDD.

Essentially, this research serves as a preliminary attempt to develop knowledge about the

recipients of PBHC services delivered in CMH agencies, a setting that employs large proportions

of trained social workers and is one in which clients in the population studied are likely to

present for social work services (NASW, 2011). The current study modestly contributes to

knowledge needed to inform the process of healthcare reform efforts that prioritizes the client

and aims to holistically manage comorbid chronic physical and behavioral health conditions. The

current study sought to develop and refine an integrated profile of clients with MDD in CMH

centers. This knowledge is a necessary precursor for developing integrated approached that are

responsive, culturally competent, and effective.

Sample Characteristics

This section examines differences in key sample characteristics between the original

study by Lemieux et al. (2015) and the current study, which examined only participants

diagnosed with MDD, a specific subpopulation that was overrepresented in the original study

(32.3%). This latter finding is consistent with the study by Druss et al. (2010) in which the majority of clients were diagnosed with MDD (43.9%).

Sociodemographic Characteristics

The typical participant was a middle age woman who was unemployed, but had a high school diploma. In regards to gender, the proportion of the female participants diagnosed with MDD (75.5%) was larger than that reported by Lemieux et al. (2015) at 67.2%. The disproportionate representation of females in the current study is consistent with literature showing that mood disorders are far more prevalent in women than men (Ferketich et al, 2000; NIMH, 2014). The sample of the current study consisted of similar proportions of African Americans (51.2%) and Whites (48.8%), whereas Lemieux et al. (2015) reported a greater proportion of African Americans than Whites at 60.8% and 36.2%, respectively. The original study was consistent in terms of health disparities because historically minorities have and continue to experience greater health disparities than Whites (CDC, 2013; National Institutes of Health; NIH, 2010). However, the proportionate representation of African Americans in the current study is in contrast to national studies reporting that minorities are, on average, 30% less likely than Whites to experience any mood disorder in the general population (NIMH, 2014). While this finding may not be consistent with national statistics, it does represent a marked increase from the original study in the proportion of White participants who are disproportionately affected by MDD. Participant's employment status and educational attainment were consistent with the original research, and both characteristics reflected those of the clients at the CMH agency from which the current sample was drawn (Lemieux et al., 2015). According to the most recent reports of educational attainment in the general U.S. population, the proportion of current sample with at least a 12th grade education (67.6%) was considerably

less than that of the general population, at 88.4% (Ryan & Bauman, 2016). When considering the most recent statistics of unemployment in Louisiana, the current sample exhibited far higher rates of unemployment than the general population (76.8% and 6.1%, respectively; Bureau of Labor Statistics, 2016). These latter differences could be due to the fact that one of the main features of MDD is lethargy and anhedonia, symptoms that may be associated with poorer functioning in school and work (APA, 2013). With regard to disability, participants exhibited a disability rate almost twice that of the general population of Louisiana at 16.9% and 8.8%, respectively (Social Security Administration; SSA, 2015). In the context of the disease burden, MDD has the highest disability-adjusted life years (DALYs) of all mental and behavioral disorders at 3.73% of all total U.S. DALYs (NIMH, 2010). MDD is a leading cause of disability, and some of the more debilitating symptoms of MDD (e.g., memory impairment, difficulty concentrating) render many individuals unable to maintain stable employment (APA, 2013; NIMH, 2010).

Health Characteristics

Health indicator scores. In terms of health indicator scores, the average scores on BMI, systolic BP, and lipid total were greater in the current study than those reported by Correll et al. (2010) in the national cardiometabolic screening program study. In addition, the proportions of participants at risk in the original study on measures of BMI, systolic BP, and blood glucose (at 72.2%, 50.4%, and 34.4%, respectively) were lower than those of participants in the current study (82.4%, 56.0%, and 39.8%, respectively). These results suggest that among the SMI population, persons with MDD could be disproportionately affected by at-risk health indicator scores and potentially worse health outcomes. On the other hand, the elevated risk found among participants in the current study could be related to geographical location. According to a recent

national health disparities report by the Office of Women's Health (OWH), the state in which the study took place is among the states with the highest mortality rates due to cardiovascular disease (OWH, 2014). High rates of poverty in the region limit access to preventative healthcare (CDC, 2013). In addition to these latter structural inequalities, research has shown that individuals with MDD may be unwilling and unable to seek out preventative and routine care (Katon et al., 1990, Katon, 2003). As observed by Lemieux et al. (2015) in the original study, participants in the current study voluntarily participated in the integrated PBHC program to enhance their overall health and well-being. It is possible that there are CMH clients that remain unidentified, and are at even greater risk of poor health outcomes. However, the elevated risk found in the current study, when considered in light of the fact that substantial proportions of participants reported a personal history of cardiometabolic conditions, suggests that clients with comorbid conditions remained undiagnosed or untreated.

Health characteristics. Regarding health characteristics, a higher proportion of participants in the current study reported a personal history of diabetes (25.3%) and high blood pressure (53.8%) than did the sample in Lemieux et al. (2015) at 17.6% and 43.2% respectively. These differences could potentially indicate that individuals with MDD may experience a slightly increased risk of developing diabetes or hypertension and further underscore the need for adequate screening of clients with MDD in CMH settings. However, less than one-fifth of participants reported a personal history of cardiac disease (16.5%), which is inconsistent with literature reporting a higher prevalence of cardiovascular disease among CMH clients. For example, the prevalence of cardiovascular disease reported by Correll et al. (2010) was 54%; and the rates reported by Druss et al. (2010) and Parks et al. (2006) were 45.5% and 49% respectively. CMH clients are frequently undiagnosed, which may explain the relatively low

prevalence of heart disease reported in the current study. It must be noted that participants in the current study self-reported information about personal history of cardiometabolic disorders. Given the findings that 63.8% of participants reported a family history of cardiac disease, 51.7% smoked, and at least 29% or more were at risk on one or more health indicators, it is likely that participants were undiagnosed with cardiovascular disease at the time of admission. Future research should seek to verify self-reported diagnoses, whenever possible.

As far as family history is concerned, a slightly greater proportion of participants in the current study reported a family history of diabetes (69.0%) than did in the original study (66.4%). There was also a greater proportion of participants in the current study than in the original study reporting a family history of high blood pressure (at 83.2% and 77.6%, respectively). This is notable due to the genetic heritability of cardiometabolic conditions which places those with MDD at risk of developing chronic diseases, including high blood pressure (Katon et al, 1990; Katon, 2003). Future research should ask about a family history of MDD to better examine these associations.

Health-risk characteristics. Similar proportions of participants in the current study and original study reported tobacco (at 51.7% and 53.2% respectively) and alcohol use (at 31.5% and 33.6% respectively). The rates of tobacco and alcohol use reported in the current study are lower than those previously reported in studies by Druss et al. (2010) and Hartz et al. (2014) who reported that persons with SMI are four times more likely to use substances, as compared to the general population. Comorbid alcohol use disorder and MDD are associated with increased suicide ideations and attempts (Britton et al., 2015). Alcohol is known as a central nervous system depressant, which results in cognitive impairment and sedation that amplify depressive symptomology (Britton et al., 2015). While this study did not diagnose an alcohol use disorder, it

is nonetheless important to consider the risk of co-occurring MDD and alcohol use. Well over twice as many participants in the current study (24.5%) than in the original study (9.6%) reported use of other non-prescribed substances. This is especially concerning, because co-occurring substance use and depressive disorders has been shown to worsen the course of recovery (Brook et al., 2002). It is possible that participants were, in fact, receiving some type of substance abuse treatment. The results of the current study indicate that CMH clients with MDD would likely benefit from interventions targeting tobacco, alcohol, and substance use. It is possible that this is another area of future research that could benefit from incorporating longitudinal data. It is possible that tobacco, alcohol, and substance use in the current study was underreported because of self-report that was not confirmed with documentation or drug screening, which would improve validity in future research.

Psychosocial Characteristics

The mean overall health score for participants in the current and original studies was 2.29, indicating fair overall health. Future research should compare self-assessed health scores across diagnoses to determine whether there is variability in how different CMH clients perceive their health. In a similar vein, the mean K6 scores measuring psychological distress were comparable for participants in the current (12.53) and original studies (12.18). It is possible that CMH clients similarly rate their psychological distress similarly because they would be presumed to be generally stable receiving outpatient rather than inpatient care. However, participants in the current study showed slightly lower levels of social support (14.72) as compared to those in the original study (15.17), although both of these latter scores indicate moderately high levels of social support. Depression often results in withdrawing from activities with other individuals (APA, 2013). In fact, research shows that individuals with MDD

experience lower social support, in general, which in turn negatively impacts recovery (Chronister et al., 2015; Roessler, 2006). As compared with the original study, participants in the current study reported notably lower levels of daily functioning (at 27.4% and 21.8%, respectively). Although conclusions cannot be drawn from two different samples, it is well established that MDD can be debilitating in terms of day-to-day functioning (APA, 2013; Ciechanowski et al., 2000; Goodman & Whittaker, 2002).

Differences in Social Support

Two significant differences in social support emerged in the current study: gender and family history of high blood pressure. Women reported higher levels of social support and participants with a family history of high blood pressure reported significantly higher levels of social support than those without a family history. This finding is spurious and can be explained by a post-hoc analysis showing that participants with a family history of high blood pressure were significantly overrepresented by women. Recent research has examined how men and women differently prioritize and perceive social support, a variable robustly associated with the mitigation of depression (Martínez-Hernáez 2016). Using a qualitative approach, Martínez-Hernáez (2016) found that men prefer social support that assists them in attaining self-control to cope with depression; conversely, women prefer social support that helps them attain awareness and process emotional distress (Martínez-Hernáez, 2016). The results of this latter study suggest that the higher levels of social support reported by women are associated with their preference for interdependence (Martínez-Hernáez 2016). In terms of the CMH population specifically, research shows that women seek out social support in the form of supportive conditions, guidance and advice, and community participation whereas men have more difficulty obtaining social support in the form of resources, information, and assistance with day-to-day living

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(Chronister et al., 2015). This latter finding may reflect gender norms that encourage males to be more autonomous than females, placing them at a disadvantage even when suffering from a disabling health condition (Chronister et al., 2015; Martínez-Hernáez 2016). Additional research is needed to understand the relationship between gender and social support and its impact on outcomes.

Interrelationships among Characteristics

The study aimed to examine interrelationships among social support, health (health indicator scores, overall health) and psychosocial characteristics (level of functioning, psychological distress) among adults with MDD in an integrated PBHC program. Results showed that higher levels of HDL were weakly associated with increased age, being female, and being White. However, higher levels of HDL are a positive attribute unlike the other indicators. With regard to gender differences, the current research is consistent with previous research that middle-aged women have higher levels of HDL (Russo et al., 2015). Russo et al. (2015) attributed these differences to higher estrogen levels. However, HDL is only one indicator, and women have more difficulty reaching LDL targets than men (Russo et al., 2015). In terms of systolic BP and age, physical health generally decreases with age, and older age is associated with an increased risk of developing chronic cardiometabolic conditions (Wen et al., 2015). Further research should examine the interaction of race and gender to determine whether such interactions are associated with HDL.

Consistent with Lemieux et al. (2015), overall health in the current study was associated more strongly with the psychosocial characteristics of daily functioning and psychological distress than with any physical health indicator. Likewise, there were four correlates of social support: gender, overall health, daily functioning, and psychological distress. These results

suggest that psychosocial rather than objective health characteristics were more strongly related to participants' perceptions of their health. The interrelationships among overall health, daily functioning, psychological distress, and social support is best considered in the context of a comprehensive view of heath, which is consistent with the biopsychosocial perspective. The findings support a comprehensive approach to assessing the functioning of clients in CMH settings (Lemieux et al., 2015). Seeing as social support has been established as an important social determinant of health, multivariate approaches are needed to determine the combination of variables that best predicts social support among CMH clients with MDD (Kobau & Zack, 2013; Nover, 2013).

Conclusions

Participants in the current study represented a subsample of CMH clients diagnosed with MDD. Physical health (e.g. personal and family history of cardiometabolic conditions) and health-risk characteristics (e.g. tobacco and alcohol use) were comparable to that found in other CMH samples (Correll et al., 2010; Druss et al., 2010, Lemieux et al., 2015). However, differences in substance abuse and health indicator scores suggest that individuals with MDD may have a higher risk of experiencing poor health outcomes. Furthermore, despite enrollment in an integrated PBHC program, health indicator data suggest that participants may have had undiagnosed and untreated comorbid conditions. Social support was more strongly correlated with daily functioning, psychological distress, and overall health (psychosocial characteristics) than with objective health indicator scores.

Limitations and Strengths

As with all cross-sectional studies, it is important to acknowledge limitations as data was collected at one point in time. Generalizability of the findings of this study to other PBHC

programs and CMH agency settings is limited due to the fact that the clinical sample was collected from one geographical area. Thus, the findings can only be generalized to similar PBHC programs in similar CMH settings. Related to sample size, a total of 407 cases were used for current analyses. There a notable amount of missing data on two health indicators: BMI (*N*=335, 82.3%) and LDL (*N*=353, 86.7%). Consequently, there were only 292 paired cases used in correlational analysis. This association was non-significant and extremely weak, at -.01. These variables were examined to determine whether there were any patterns that could potentially bias results of bivariate analyses. Given that over 80% of participants were at-risk on BMI, the lack of variability would suggest that missing data did not exert an undue influence on bivariate analyses. BMI data were missing because participants likely refused to be weighed at intake, and weight is needed to calculate BMI scores. LDL and other laboratory indicator data were missing because these tests had to be ordered and the results forwarded to the nurse care manager. The problem of missing lab data occurred at all 3 sites, which suggests that the proportion at-risk may have been either overestimated or underestimated. Nevertheless, the main variable of interest, social support, was not significantly associated with any mechanical or laboratory indicators, further suggesting that missing data resulted in random error. Further, the subsample size of 292 (for BMI x LDL) was adequate in terms of power for the analysis. Further research should seek to confirm that protocols are in place at clinic sites to ensure that mechanical and laboratory data are collected and recorded for all participants.

Measurement may be an issue. Self-report data were used to gather information about health-risk behaviors and overall health, which introduces potential problems with reliability and validity. Participants may have underreported tobacco, alcohol, and substance use, lest they portray themselves in an unfavorable light (Rubin & Babbie, 1997). Conversely, participants

may have exaggerated the severity of health problems to ensure eligibility for resources (DeSalvo et al., 2006; Rubin & Babbie, 1997). Therefore, future research should aim to validate self-reported health risk and health conditions with objective data, such as laboratory tests and medical records. The current study made no attempt to examine health and other outcomes over time. Thus, longitudinal studies are needed to shed light on how social support and its correlates vary, over time, for participants in integrated PBHC programs.

Despite its limitations, the present study contributes to a burgeoning area of research on integrated PBHC services and the clients who receive these services. It is the first study to utilize an extensive integrated dataset to examine health, health-risk factors, and sociodemographic and psychosocial characteristics of CMH clients with MDD. Another strength of the study is the focus on both health and psychosocial characteristics. The findings are consistent with literature demonstrating the interrelationships of physical and mental health (Engel, 1977). The current study is theoretically grounded in the biopsychosocial model and social support theory, both of which are relevant to holistic models of integrated care (Heath et al., 2013). Another strength is the reliability of the measures of daily functioning, psychological distress, and social support. The PDF, K6, and PSC scales showed adequate internal consistency as evidenced by acceptable Cronbach's alpha coefficients (Rubin & Babbie, 2005). Thus, the findings indicate that these 3 scales are reliable for assessing individuals with MDD receiving integrated PBHC in CMH settings. The use of objective health data (i.e., laboratory health indicators) is an additional strength of the study.

Implications for Social Work

    Research. There is a scarcity of research in the social work literature that has been undertaken with participants in integrated PBHC programs, and this study highlights, in

particular, the importance of social support. Future research should incorporate longitudinal data to shed light on whether social support was associated with attrition from the program, as well as to enable researchers to examine improvements in health outcomes over time. Future research should also aim to validate participants' self-reports of cardiometabolic disorders with objective data from sources like medical records and/or laboratory tests.

Practice. The findings of the current study underscore the relevance of social work practice in integrated PBHC settings. Such approaches emphasize comprehensive and multidimensional assessments that encompass all biopsychosocial factors (Horevitz & Manoleas, 2013). Given the frequency with which social workers encounter clients with depression, practitioners should be prepared to prevent and address health-risk behaviors of clients with MDD through screening and early intervention. The disparities that emerged in the current study with regard to social support emphasize the need for culturally-competent practice in integrated settings. For example, men may be at a higher risk due to apparent deficits in social support, which is an established social determinant of health. Although the current study did not compare outcomes across disorders, among persons with SMI, individuals with MDD may be at particular risk of poor health outcomes because of the health burden associated with depression. The current study also suggests that social workers should pay particular attention to family history of cardiometabolic conditions. Given their prominence in the mental health workforce, social workers can play a vital role in advocating for culturally-responsive practices with diverse clients with MDD receiving PBHC services.

Education. Emergent changes in healthcare policy and delivery require all providers, including social workers, to learn new skills to practice effectively in integrated PBHC settings. Schools of social work should continue developing curricula that teach social work students

about the relevance of the biopsychosocial perspective for understanding health, a point under

scored by the findings of the current study. In addition, it would behoove students to gain

practice experience in the field, learning how to function in interdisciplinary integrated settings.

It is also important for current social work practitioners to obtain continuing education hours to

learn the latest information about diversity within the population of clients with MDD. In

integrated settings, assessment and intervention knowledge is tailored to the population being

served. The findings of the current study emphasize the importance of ensuring that social work

education and training efforts keep pace with practice as it evolves in the field.

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APPENDIX: LSU IRB APPROVAL FOR EXEMPTION

ACTION ON EXEMPTION APPROVAL REQUEST

LSU

Institutional Review Board
Dr. Dennis Landin, Chair
130 David Boyd Hall
Baton Rouge, LA 70803
P: 225.578.8692
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TO: Blaine Masinter
            Social Work

FROM: Dennis Landin
            Chair, Institutional Review Board

DATE: February 4, 2016

RE: **IRB#** E9754

TITLE: Interrelationships Among Physical Health, Health Risks Factors, Psychosocial Characteristics
            and Social Support in Individuals with a Mood Disorder Receiving Integrated Care in
            Community Mental Health Settings

New Protocol/Modification/Continuation: New Protocol

Review Date: 2/4/2016

Approved_____X_____ Disapproved_____

Approval Date: 2/4/2016   **Approval Expiration Date:** 2/3/2019

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

Blaine Stewart Masinter was born and raised on Baton Rouge, Louisiana. She graduated from St. Joseph's Academy in 2010 with academic honors and upon receiving the TOPS Honors Stipend enrolled at Louisiana State University where she received her Bachelor of Science in Psychology with dual minors in biological sciences and chemistry in 2014. As an undergraduate, she was a member of many organizations, including the Louisiana State University Honors College, Psi Chi National Psychology Honor Society, and Kappa Alpha Theta Sorority where she participated in volunteer and philanthropic work, including Habitat for Humanity, Court Appointed Special Advocates, and the Baton Rouge Crisis Intervention and Suicide Prevention Line. During this time she gained experience in research as a student worker for Dr. Eric Ravussin at Pennington Biomedical Research Center.

In the fall of 2014, Blaine matriculated at the Louisiana State University School of Social Work to pursue her Master of Social degree. Over the course of two years she has interned at Our Lady of the Lake Regional Medical Center and Jefferson Oaks Behavioral Health where she gained clinical experience in individual and group counseling to those facing personal, developmental, and social issues. During her tenure in the program, she also served as president of Alpha Delta Mu Social Work Honor Society and was appointed as a student representative for the Louisiana Group Psychotherapy Society. Her interests include the biological and chemical bases for neuropathology in addition to anxiety and mood disorders and their subsequent effect on risk taking and addictive behaviors, such as legal and illicit substance use and eating disorders, specifically their effect on stress and emotional health of adolescents and young adults. Upon completion of her degree she plans to further develop these interests by pursuing doctoral studies and become a licensed practicing clinician