Spring 3-29-2011

Perceived Health Status, Source of Care and Health Outcomes of Individuals with Self-Reported Mental Disorders

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Recommended Citation
Lumansoc, Rita Marie W. Dr., "Perceived Health Status, Source of Care and Health Outcomes of Individuals with Self-Reported Mental Disorders." Dissertation, Georgia State University, 2011.
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ABSTRACT

PERCEIVED HEALTH STATUS, SOURCE OF CARE AND HEALTH OUTCOMES OF INDIVIDUALS WITH SELF- REPORTED MENTAL DISORDERS

by

Rita Marie Wi-Lumansoc

In Healthy People 2010, mental health is listed as a major public health concern as evidenced by an alarming increase in the number of individuals who suffer from mental disorders. Mental disorders are a treatable public health condition. However, health disparities in the treatment of mental disorders are evident. The purpose of this study was to examine factors that affected health outcomes of persons with mental disorders. Two specific aims were addressed: Aim 1: to examine the relationships of population characteristics (predisposing factors and enabling resources), health behaviors (health services use and health practice); and health outcomes (physical health status and mental health status); Aim 2: to determine the differences in the usual source of care and health outcomes between individuals with self-reported mental disorders and individuals without mental disorders. This study was a secondary analysis of existing data collected from 2006 Medical Expenditure Panel Survey Household Component Consolidated file. A sample of U.S. civilian non-institutionalized adults (N=622) was grouped according to three self-reported health conditions: mental disorders (MD), physical illnesses (PI) and co-morbid mental disorders and physical illnesses (CM). This sample was predominantly male, White non-Hispanic and married; had a high school diploma, middle to high income, and private insurance; and preferred office-based clinics as the usual source of care, $F(2,29)=5.94$, $p = .007$. No statistically significant differences between groups in

usual source of care (*p*=.069) and physical health status (*p*=.490) but there was a significant difference in mental health status (*p*=.001). Participants with CM had a poorer mental health status than those with PI and MD, *F* (2,619) =21.8, *p*= .000. The mental health status of individuals with PI was significantly better than that of participants with MD.

Awareness of disparities in the usual source of care, health services use, and health outcomes among individuals with mental health conditions is imperative if barriers to care are to be eliminated. Innovative interventions pertinent to decreasing barriers to accessing health care and improving the health outcomes among individuals with MD must be tested. Advocating for mental health care policies that reduce health care services disparities among individuals with self-reported MD must be encouraged.

PERCEIVED HEALTH STATUS, SOURCE OF CARE AND HEALTH OUTCOMES OF INDIVIDUALS WITH SELF- REPORTED MENTAL DISORDERS

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RITA MARIE WI-LUMANSOC

A DISSERTATION

Presented in Partial Fulfillment of Requirements for the
Degree of Doctor of Philosophy in Nursing in the Byrdine F. Lewis
School of Nursing in the College of Health and Human Sciences
Georgia State University

Atlanta, Georgia

2011

ACKNOWLEDGMENTS

This paper is about people with health needs and how they go about accessing those resources and assistance to meet those needs. I would like therefore, to take this time to recognize those special people who have been an invaluable resource and assistance in meeting my deepest need of completing this dissertation. Many have helped me along the way and I would not have completed this undertaking apart from their unselfish devotion and commitment. Thank you, Dr. Cecelia Grindel for agreeing to be the chair of my dissertation committee and for taking me under your tutelage. Your wealth of knowledge has helped me in my doctoral journey. To Dr. Carol Howell and Dr. Julia Perilla, your kind support and encouragement helped me persevere at pivotal times when the easiest thing to do was to give up. To my beloved spouse, my loving children, as well as to my siblings and relatives, your prayers and incessant reminders to complete my studies have motivated me never to give up on my dreams of earning my doctoral degree.

Some very special people are worth mentioning. My sincere gratitude to Dr. Huey Chen for being my advocate, for her patience and understanding of my emotional ups and downs as I navigated the research proposal defense. A great appreciation to Dr. Phyllis Parks-Veal whose keen and detailed proofreading helped me articulate my research in written form. I am indebted to Dr. Flor Culpa-Bondal whose expertise in data analysis has been instrumental in organizing my research data and assisting with interpretation of the findings.

I would like to thank Macon State College and Georgia State University for the financial support. The tuition assistance program and scholarship funds were of great

help especially in this difficult economic period. My professors at Georgia State University were also helpful in establishing a solid academic foundation for my doctoral studies.

My heartfelt appreciation to my faculty colleagues and unmentioned friends who have provided me with emotional boost contributed to the success of achieving this educational endeavor. To all of you, I would like to say, “Maraming Salamat Po!”, my Filipino way of saying “Thank you very much!”.

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LIST OF ABBREVIATIONS

AC	Access to Care
ANOVA	Analysis of Variance
BMHSU	Behavioral Model of Health Service Use
CAHPS	Consumer Assessment of Health Plans
CCCODEX	Clinical Classification Code
CE	Condition Enumeration
CM	Co-Morbid Mental Disorders and Physical Illnesses
COPD	Chronic Obstructive Pulmonary Disease
DSM IV-TR	Diagnostic Statistical Manual Fourth Edition Text Revision
DUPERSID	Person’s Dwelling Unit Identification and Person’s Identification Number
HC	Household Component
K6	Kessler Index
MANCOVA	Multivariate Analysis of Covariance
MANOVA	Multivariate Analysis of Variance
MD	Mental Disorders
MEPS	Medical Expenditure Panel Survey
PHQ-2	Patient Health Questionnaire
PI	Physical Illnesses
PV	Provider Roster
RE	Demographic Data Re-Enumeration
SAQ	Self Administered Questionnaire

CHAPTER I

Introduction

In Healthy People 2010, mental health is listed as a major public health concern due to the alarming increase of the number of individuals who suffer from mental disorders. Mental disorders are treatable. However, health disparities in the treatment of mental disorders remain an issue because mental disorders are superficially acknowledged and the number of mental health specialists is inadequate (National Center for Health Statistics, 2010). According to the 2004 U.S. Census, an estimated 57.7 million Americans or about 26.2% of the total residential adult population have a diagnosable mental disorder (National Institute of Mental Health, 2010).

Untreated medical conditions and lack of attention to modifiable risk factors are reported as causes of an increase in serious morbidity and mortality rates among individuals with mental disorders. The medical conditions that have been implicated in the increased mortality rate among individuals with mental disorders are cardiovascular disease, diabetes, respiratory disease and infectious diseases. Lack of access to health care due to poor coordination between mental health and physical health care providers is another contributory factor in the increased rate of morbidity and mortality among individuals with mental disorders (Parks, Svendsen, Singer, & Foti, 2006).

Smoking has been associated with mental disorders resulting in high rates of morbidity and mortality among individuals who smoke and have mental disorders.

Tobacco control efforts were suggested as ways to address both physical and mental status of individuals who smoke and have mental disorders (Lawrence, Mitrou & Zubrick, 2009).

Consistently, from 1996 to 2006, mental disorders were the top five most costly health conditions and accounted for the largest percentage increase in the number of U.S. civilian non-institutionalized individuals (from 20 million to 40 million people). Medical expenses for mental disorders among the U.S. civilian non-institutionalized population rose from $19.3 million to $36.2 million per year (Olin & Rhoades, 2005; Soni, 2009).

Individuals with mental disorders often have unmet service needs for both mental health and physical health care (Barrio et al., 2008; Garrett & Yemane, 2006; Palinkas et al., 2007). Lack of a regular source of health care is a critical issue for individuals with mental disorders. Primary care physicians have difficulty in referring their patients for mental health/substance abuse services resulting in misdiagnosed, underdiagnosed, mistreated or untreated individuals (Shepherd, 2009).

Numerous studies have been conducted on access of mental health care and mental health service use for those individuals with mental disorders but few studies have been done on access to physical health care (Tsay et al., 2008). Currently, only a few studies comparing the differences of usual source of care (USC) between adult non-institutionalized individuals with mental disorders and adult non-institutionalized individuals without mental disorders have been reported. Similarly, studies comparing differences of perceived health status between individuals with mental disorders who have usual source of care and those who do not have usual source of care are limited. It is important to identify factors related to the lack of a usual source of care by adult non-institutionalized individuals with mental disorders in order to address the service disparity. Therefore, a study that primarily focuses on usual source of care and perceived health status of individuals with mental health disorders is needed, relevant, timely and appropriate.

Statement of the Problem

Mental health is a major public health problem in the United States because of the increasing mortality and morbidity rates associated with mental illness (Prevention Institute, 2009). Individuals with mental disorders have two to three times higher mortality rate compared to those without a mental disorder (Muller-Oerlinghausen, Berghofer, & Bauer, 2002). Smoking, alcohol consumption, lack of exercise and poor nutrition are indicated as modifiable risk factors that put individuals with mental disorder at a higher risk for morbidity and mortality (Parks et al., 2006).

Individuals with mental disorders face health disparities related to costly medical expenses. Differences by race, ethnicity, age, income, gender and geography, affect the fair allocation of resources among individuals with mental disorders. These disparities in mental health have a great impact on the health status of individuals with mental disorders (Quill, 2001).

The existence of health care disparities has greatly affected the health status of individuals with mental disorders. High co-morbidity of physical and mental health conditions, inadequate access to health care, and service fragmentation among the mental health and physical health service delivery systems are some of the challenges faced by individuals with mental disorders (Gill, Murphy, Zechner, Swarbrick, & Spagnolo, 2009).

Morbidities and mortalities among individuals with mental disorders will continually increase if health care disparities are not properly addressed. The relationship between access to care and perceived health status has not been well established (McGuire, Gelberg, Blue-Howells, & Rosenheck, 2009). Exploring the demographic factors of individuals with mental disorders in relation to their usual source of care and how they perceive their physical and mental health status provides insight into understanding factors that contribute to health disparity in this population. Understanding the health care disparities particularly differences in the usual source of care and its relationship to physical and mental health status is vital in developing and implementing health care interventions and policies to properly provide needed services for individuals with mental disorders (Studts, Stone, & Barber, 2006; Wiechelt, Delprino, & Swarthout, 2009; Xiao & Barber, 2007).

Statement of Purpose

The purpose of this exploratory study was to examine factors that affected health outcomes of persons with mental disorders. This purpose was actualized by the exploration of two specific aims. The first specific aim (A1) was to examine the relationships of population characteristics (predisposing factors and enabling resources) health behaviors (health services use and health practice) and health outcomes (physical health status and mental health status). The second aim (A2) was to determine the differences in the usual source of care and health outcomes between individuals with self-reported mental disorders and individuals without mental disorders. Understanding these relationships and differences provides a better understanding about health conditions, the usual source of care, and the health behaviors associated with the health outcomes of individuals with self-reported mental disorders. Through this understanding, strategies to address issues regarding access to usual source of care faced by individuals with mental disorders can also be recommended.

Significance to Nursing

The study sought to examine the relationships of mental disorder, usual source of care and health status as well as the differences in the usual source of care and health outcomes between individuals with self-reported mental disorders and individuals without mental disorders. The findings of this study provide an increased awareness of the issues related to usual source of care, health care services use, perceived health status and health outcomes of individuals with mental disorders. The results of this study reinforce the need for advocating for mental health policies and integration of health care services for both mental and physical health needs among individuals with mental disorders.

Research Questions

To examine the specific aims, the following research questions were addressed:

- Aim 1 Research Question 1 (A1R1): What is the relationship of population characteristics [(predisposing factors{health conditions (mental disorders, physical illness, co-morbid mental disorders and physical illness)}, demographic factors {age, gender, race, ethnicity, education, marital status}, socio-economic status {poverty status}, health attitudes and perceived health status {perceived health status, perceived mental health status}), enabling resources (usual source of care {provider type}, health care practitioner's characteristics {health care practitioners' gender, race and ethnicity}, personal/family resources {insurance status}, and community resources {usual source of care location and transportation mode})] and health behaviors (health services use {office-based clinic visits and outpatient hospital-based clinic visits} and health practice {smoking habit})?

- Aim 1 Research Question 2 (A1R2): What is the relationship of population characteristics [(predisposing factors {health conditions (mental disorders, physical illness, co-morbid mental disorders and physical illness)}, demographic factors {age, gender, race, ethnicity, education, marital status}, socio-economic status {poverty status}, health attitudes, and perceived health status {perceived health status, perceived mental health status})], and health behaviors (health services use {office-based clinics visits, outpatient hospital-based clinics visits} and health practice {smoking habit}) controlling for selected moderating factors, enabling resources (usual source of care {provider type}, health care practitioner's characteristics {health care practitioners' gender, race and ethnicity and provider type}, personal/family resources {insurance status} and community resources{usual source of care location and transportation mode})?
- Aim 1 Research Question 3 (A1R3): What is the relationship of population characteristics [(predisposing factors{health conditions (mental disorders, physical illness, co-morbid mental disorders and physical illness)}, demographic factors {age, gender, race, ethnicity, education,

marital status}, socio-economic status {poverty status}, health attitudes, and perceived health status {perceived health status, perceived mental health status}, and enabling resources (usual source of care {provider type}, health care practitioner's characteristics health care practitioners' gender, race and ethnicity}, personal/family resources {insurance status},and community resources {usual source of care location, transportation mode})], health behaviors (health services use {office-based clinic visits, outpatient hospital-based clinic visits}, health practice {smoking habit}), and health outcomes (physical health status {physical component summary} and mental health status {mental component summary})?

- Aim 1 Research Question 4 (A1R4): What is the relationship of population characteristics [(predisposing factors (health conditions {mental disorders, physical illness, co-morbid mental disorders and physical illness}, demographic factors {age, gender, race, ethnicity, education, marital status}, socio-economic status {poverty status}, health attitudes, and perceived health status {perceived health status, perceived mental health status})], health behaviors (health services use {office-based clinic visits, outpatient hospital-based clinic visits}and health practice {smoking habit}), and health outcomes (physical health status {physical component summary}and mental health status {mental component summary}) controlling for selected moderating factors [enabling resources (usual source of care {provider type}, health care practitioner's characteristics{health care practitioners' gender, race and ethnicity}, personal/family resources {insurance status} and community resources {usual source of care location and transportation mode})]?

- Aim 2 Research Question 1 (A2R1): Is there a significant difference in usual source of care between individuals with self-reported mental disorders and individuals without mental disorders?
- Aim 2 Research Question 2 (A2R2): Is there a significant difference in physical health status between individuals with self-reported mental disorders and individuals without mental disorders?
- Aim 2 Research Question 3 (A2R3): Is there a significant difference in mental health status between individuals with self-reported mental disorders and individuals without mental disorders?

Theoretical Framework

Overview of the Behavioral Model of Health Services Use

The Behavioral Model of Health Service Use (BMHSU) guided the development of the specific aims of this study. The BMHSU was developed to understand, predict and explain the means of and reasons for individual health care use. There were several revisions and four phases of modifications that occurred since the original model was developed in 1968 by Ronald Andersen (Andersen & Aday, 1978; Rebhan, 2010).

History of BMHSU

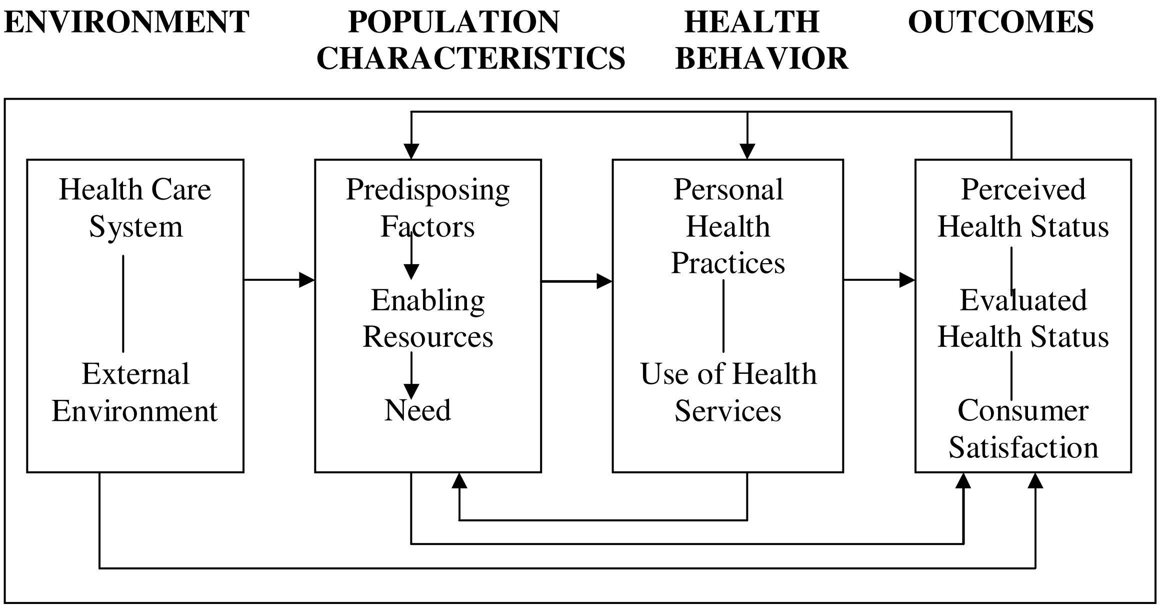
In Phase 1, the BMHSU had three categories namely predisposing characteristics, enabling characteristics, and need characteristics. Predisposing characteristics include demographics, social structure and health beliefs. Enabling characteristics include family resources and community resources. Need characteristics include perceived needs and clinically evaluated needs. Phase 2 of Andersen's model was revisited in 1978. In Phase 2, the health care system and consumer satisfaction were added. The health care system includes policy, resources and organization. Consumer satisfaction includes convenience, availability, financing, provider characteristics and quality. The model was again revised in 1980s and 1990s for Phases 3 and 4. In Phase 3, a linear relationship model emerged with three constructs, primary determinants, health behaviors and health outcomes. Primary determinants included population characteristics, the health care system and the external environment. Health behaviors included personal health practices and health services use. Health outcomes include perceived health status, evaluated health status and consumer satisfaction. In Phase 4, the emerging model of BMHSU was developed which composed of four main constructs; the environment, population characteristics, health behaviors and outcomes (Andersen, 1995).

Description of the BMHSU

Andersen's emerging model of BMHSU was used as a guide for structuring the specific aims and research questions in this study. The environment consists of the health care system and external environment. The health care system includes policy, resources and organization. The external environment refers to the physical, political and economic components of the environment. Population characteristics consist of predisposing factors, enabling resources and need factors. Predisposing factors are demographic factors, the socio-economic structure, and health beliefs. Enabling resources include personal, family and community resources. Personal and family resources are defined as income, health insurance, and a regular source of care. Community resources include the various types of health care providers and types of health services organizations. The need factors are perceived health and evaluated health. Health behavior consists of personal health practices and the use of health services. The outcomes consist of perceived health status, evaluated health status and consumer satisfaction (Andersen, 1995).

In this model, the environment influences population characteristics and outcomes. The population characteristics influence health behavior and outcomes. Health behavior influences population characteristics and outcomes. Outcomes in return influence population characteristics and health behavior. Longitudinal and experimental study designs are recommended for further exploration of this model (Andersen, 1995). See Figure 1.1 for Andersen's emerging model-Phase 4 Behavioral Model of Health Services Use.

Figure 1.1 Andersen (1995) Behavioral Model of Health Services Use (BMHSU)



The BMHSU has been utilized in the several studies of various populations including some vulnerable populations [e.g., individuals with panic attacks (Goodwin &

Andersen, 2002); individuals on antipsychotic medications (Jano, Johnson, Chen, & Aparasu, 2008); adults with human immunodeficiency virus (Kilbourne et al., 2002); homeless women (Tam, Zlotnick, & Bradley, 2008); people with mood disorders (Wu, Erickson, Kennedy, 2009); and children with special health care needs (Kane, Zotti, & Rosenberg, 2005)]. The BMHSU was useful in guiding these studies by identifying the predictors or determinants of health service use and health outcomes among the specific population of interests.

Gelberg, Andersen, and Leake (2000) tested the expanded BMHSU model with a sample of 363 homeless people. In this study, the model consisted of population characteristics, health behavior and outcomes. Population characteristics included the three domains of predisposing factors, enabling resources and need. Consistent with the previous models, predisposing factors consisted of demographics and socio-economic structure. Health attitudes construct was included as one of the characteristics in the predisposing domain. Usual source of care construct was included as one of the characteristics in the enabling domain. Perceived health status construct was included as one of characteristics in the need domain. Health behaviors consisted personal health practices and use of health services. Tobacco use was included as one of the characteristics in the behaviors in personal health practices. Outcomes consisted of health status and satisfaction with care (Gelberg et al., 2000).

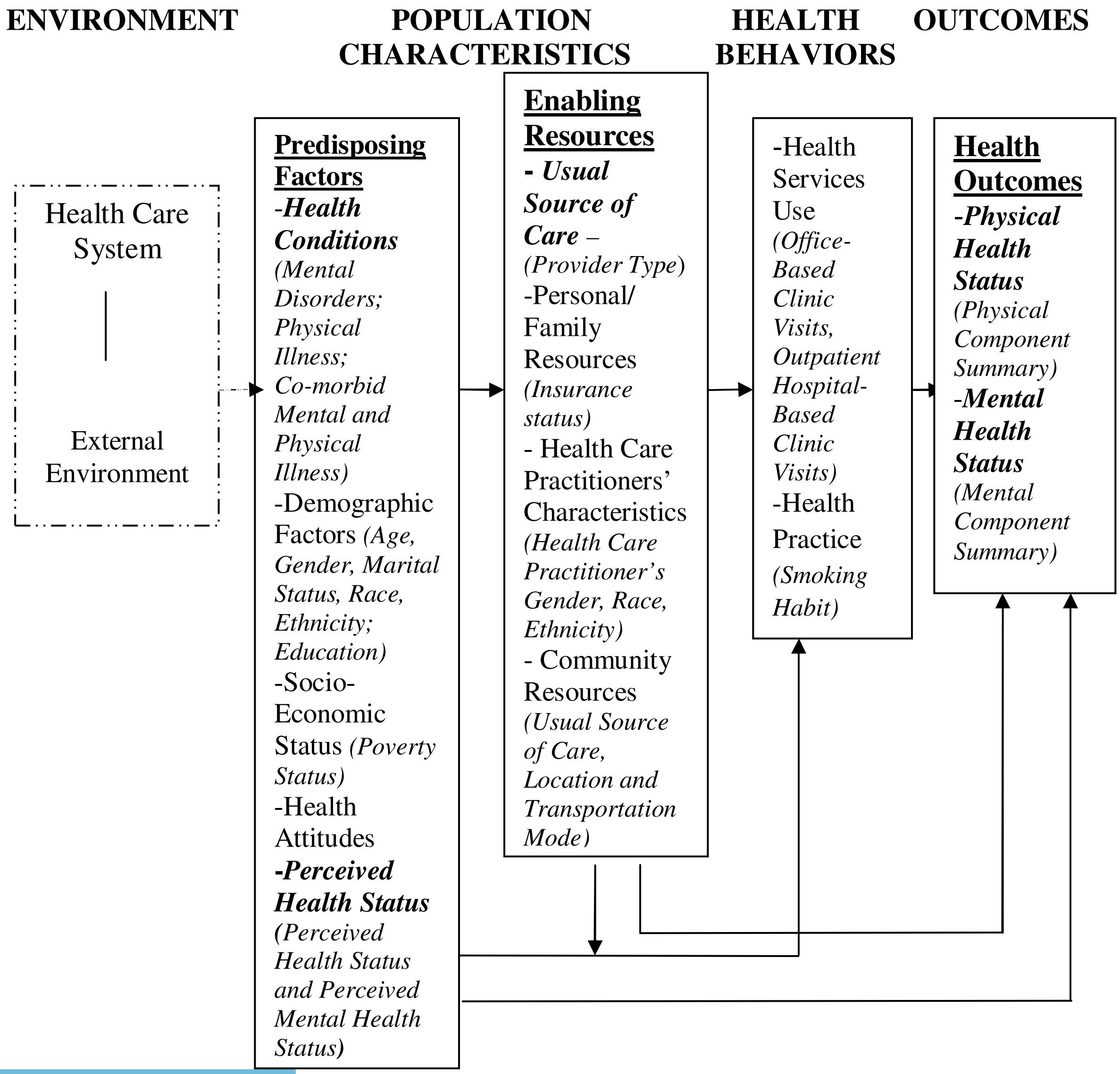
Several similarities but altered variations of the BMHSU model evolved from the study of Gelberg et al. (2000). These similarities included the omission of environment as a construct and inclusion of predisposing factors, enabling resources and perceived health status as variables of population characteristics. Additionally, usual source of care was considered as one of the enabling resources; health services use was identified as one of the health behaviors; and tobacco use or smoking habit was indicated as one of the health practices.

In this study, the influence of the environment on health outcomes is recognized but the environment was not measured because the Medical Expenditure Panel Survey (MEPS) study was a study conducted across the United States. The characteristics of the environment would have been variable in different regions, making them difficult to describe and quantify. Thus, the variables in the environment were not available in the MEPS data source. Smoking habit was selected as a variable for health practice because of its impact on the depressive symptoms and health outcomes of people with physical illness (Coultas, Edwards, Barnett, & Wludyka, 2007) and the significant association of smoking habit to poor mental health status (Jofre-Bonet, Busch, Falba, & Sindelar, 2005).

For the purpose of this study, a modified version of Behavioral Model of Health Service Use (BMHSU) was used and is shown in Figure 1.2. The main concepts of this study included population characteristics (predisposing factors and enabling resources), health behaviors (health services use and health practice) and outcomes (health outcomes). Due to the cross-sectional design of this study, feedback loops were negated and one time linear relationships were evaluated.

In this framework, predisposing factors consisted of health conditions, demographic factors, socio-economic structure, health attitudes and perceived health status. Enabling resources included the usual source of care, health care practitioners' characteristics, and personal, family and community resources. Health behaviors consisted of health services use and smoking habit. Health outcomes consisted of physical health status and mental health status. Predisposing factors and enabling resources affect health behaviors and health outcomes. Enabling resources mediates between predisposing factors and health behavior. Health outcomes are determined by predisposing factors, enabling resources and health behaviors. The italicized constructs (health conditions, perceived health status, usual source of care, physical health status and mental health status) were the variables of interest in this study. See Figure 1.2 for the modified BMHSU.

Figure 1.2 Modified Behavioral Model of Health Service Use (BMHSU)



For A1R1, predisposing factors and enabling resources were independent variables and health behaviors were dependent the variables. For A1R2, predisposing factors were independent variables, enabling resources were covariates, and health behaviors were dependent variables. For A1R3, predisposing factors, enabling resources and health behaviors were independent variables and health outcomes are dependent variables. For A1R4, predisposing factors and health behaviors were independent variables, enabling resources were covariates and health outcomes were dependent variables.

For A2R1, health conditions were independent variables and usual source of care was dependent variable. For A2R2, health conditions were independent variables and physical health status was dependent variable. For A2R3, health conditions were independent variables and mental health status was dependent variable.

Summary

Mental disorders are a treatable health concern and yet morbidity and mortality rates continue to escalate. Issues in health conditions, health attitudes, perceived health status, usual source of care, personal/family/community resources, health services use, and health practice of individuals with mental disorders should be explored to facilitate the development of strategies that improve the health outcomes of these individuals. The purpose and specific aims of the study addressed these issues by examining the relationships among population characteristics (predisposing factors and enabling resources), health behaviors (health service use and smoking habit) and health outcomes (physical health status and mental health status) of individuals with health conditions (mental disorders, physical illness and co-morbid mental disorders and physical illness).

A dearth of studies related to disparities in mental health care and mental health services use has been an additional concern. This study addressed some of those disparities by determining the differences on usual source of care and health outcomes (physical health status and mental health status) between individuals with self-reported mental disorders and individuals without mental disorders.

CHAPTER II

Literature Review

This chapter includes a review of literature. The modified Behavioral Model of Health Service Use (BMHSU) is used as the framework for presenting the review of literature. The review focuses on what is known concerning the concepts of BMHSU (population characteristics, health behavior, and health outcomes) in the context of the individuals with health conditions (mental disorders, physical illness and co-morbid mental disorders and physical illness).

Population Characteristics

The constructs of population characteristics include predisposing factors and enabling resources. Predisposing characteristics include health conditions, demographic factors, socio-economic status, perceived health status and health attitudes. Enabling resources include usual source of care, personal and family resources, health care practitioners' characteristics and community resources.

Predisposing Factors

Health Conditions. Physical illnesses, mental disorders and co-morbid medical conditions affect health behaviors such as health services utilization and smoking habit as well as health outcomes such as physical and mental health status. Coultas, et al., (2007) conducted a cross sectional study of 207 chronic obstructive pulmonary disease (COPD) patients with a smoking history to detect the health impact or predictors of depression.

They found that high levels of depressive symptoms were associated with increased physical illness related to physician visits and hospitalizations. However, the association between high levels of depressive symptoms and emergency room visits related to physical illness was not found to be significant. The authors also found that continued smoking and high perceived illness were predictors of depressive symptoms and indicated that future studies should investigate the associations between smoking and depression among outpatients with physical illness and co-morbid mental disorder and physical illness (Coultas, et al., 2007; Keizer, Gex-Fabry, Eytan, & Bertschy, 2009).

Individuals with mental disorders have significantly higher risk of having physical illnesses compared to the general population. A cross sectional study of 99 clients with schizophrenia and on antipsychotic Clozapine found that patients with a mental disorder had more positive attitude toward their physical health even though their clinical risk factors were above the normal parameters (e.g., above normal body mass index and waist circumference). The authors suggested using a collaborative approach between mental health professionals and general practitioners in monitoring the physical health status of the clients who have mental disorders (Brunero & Lamont, 2010).

Although the study of Brunero and Lamont (2010) explored the relationship between the predisposing factors of physical illness and health behaviors, the effect of usual source of care, community resources and health services use among individuals with mental disorders continues to be understudied. Furthermore, the association of health attitudes and actual health services use has not been well established. Future research must focus on this area of need in order to address health outcomes (Brunero & Lamont, 2010; Jang, Chiroboga, & Okasaki, 2009).

Individuals with mental disorders have an increased risk of developing physical illnesses which has an impact on health outcomes. Individuals with mental disorders are more likely to have unhealthy lifestyles such as smoking habit which predisposes them to hypertension or coronary heart disease (McKeown & Colman, 2006). A significant association between health outcomes and co-morbidity of physical illness and mental disorders exists but the mechanisms of the associations between physical conditions and mental disorders remain unknown. In addition, there is a scant literature on these associations so further investigation focusing on health outcomes and its associations to physical and mental illness is warranted (Sareen et al., 2006).

Individuals with mental disorders have a high risks for having untreated physical illnesses due to issues related to the use of health services, poor health practices (i.e., smoking) or negative health attitudes. Most studies have focused on the association of health attitudes and health conditions (e.g., mental disorders and physical illness). Studies exploring the relationships of smoking and health conditions and the effects of predisposing factors (i.e., demographic factors, poverty status, perceived health status, health attitudes), health services use, and health outcomes are needed to have better understanding of disparities in health care and services use.

Demographic Factors. Socio-demographic factors, socio-economic structure and health conditions are determinants of health services utilization (Shaikh & Hatcher, 2005). A longitudinal study by Lamkaddem, Spreeuwenberg, Deville, Foets, & Groenewegen (2008) with Moroccan and Turkish migrants (N= 310) found ethnicity, age and marital status were predictors of mental health status change. Age and education were the only predictors of physical health status. Health outcomes, ethnicity and age were predictors of health services use. Being a Moroccan was associated with a better mental health status while being divorced was related to deterioration of mental health status. Age was associated with a good mental health status but a deterioration in physical health status. Participants with a higher education reported better physical health status. Those who reported good mental health and physical health status used fewer health care services. Hill et al., (2007) found that gender, age, education, employment and socio-economic structure were significantly associated with physical and mental health status in individuals with arthritis (N=7,473). Individuals who were age 55 years and above, female, unemployed and had a low socio-economic status were more likely to report poor physical and mental health status and mental health conditions (Hill et al., 2007).

A study conducted by Zeber and colleagues (2009) examined the associations between patient characteristics and self- reported difficulties in accessing mental health and general medical care services among 435 Veterans with bipolar disorder. Health care costs and perceived difficulties in accessing medical care specialists were identified as reasons for avoiding mental health services use. These researchers suggested integration of mental and physical care in order to address the person's health outcomes (Zeber, Copeland, McCarthy, Bauer, & Kilbourne, 2009).

Racial and ethnic disparities in mental health services use remain a public health concern as demonstrated in two studies involving youths. In the first study of 659 foster children, researchers found that mental health services use varied among non-Hispanic Whites, African Americans, Asian Americans and Latinos. Non-Hispanic Whites (n=314, 65%) had the highest usage of mental health services while Latinos (n=131, 46%) had the least usage of these services across all severity categories (low, middle, high). After controlling for confounding factors (e.g., age, sex, severity of behavior problems, and mental health services need), Latinos were found to use significantly fewer mental health services than Whites (Garland et. al., 2000).

The second study examined mental health services use among diverse sample of youths (N=1,256) [non-Hispanic Whites (n=554, 44%), Latinos (n=332, 26%), African Americans (n=282, 22%), and Asian Americans (n=282, 7%)]. Psychiatric diagnoses, functional impairment, family income, and parental depression were found as predictors of mental health services use. Non-Hispanic Whites had the highest usage in outpatient services (i.e. specialty mental health clinics, alcohol and drug abuse treatment), 24-hour care services (i.e. inpatient psychiatric care, residential treatment) and informal mental health services (i.e. self-help groups, clergy counseling, peer counseling, alternative healers) while Asians Americans had the least usage in the three types of services. Interestingly, Latino Americans had the highest usage in informal mental health services compared to the three racial-ethnic groups (Garland et al., 2005). Consistent in these two studies is the racial-ethnic disparities in the use of mental health services. The highest mental health services use were non-Hispanic Whites while the least mental health services use were Asian Americans. Diagnoses of mental disorders and alcohol and drug abuse, low family income, and limited mental health services were the barriers to health services use (Garland et al., 2000; Garland et al., 2005).

Findings from a study comparing older and younger homeless adults (N=531) on self-reported co-morbidities of mental and physical illness and usual source of care revealed that homeless older adults were more likely to report chronic medical condition such as hypertension and/or mental health conditions such as depression, anxiety disorder and post-traumatic stress disorder than their younger counterparts. No information was provided on access and use of healthcare services. Further study is needed to explore the differences between the age groups on actual health services use, satisfaction with care services, and perceived barriers to usual source care (Garibaldi, Conde-Martel, & O'Toole, 2005).

Demographic factors can be determinants of usual source of care, health services use and health outcomes. Studies that address the barriers to health care (i.e., lack of access to a usual source of care, limited health care services) for persons with a mental disorder and/or co-morbidity of an accompanied physical illness are warranted.

Socio-Economic Status. Health status and health care disparities are embedded in the context of poverty or socio-economic status. Differences in income and poverty status that exist among racial groups affect health services use and mental health status (Miranda, McGuire, Williams, & Wang, 2008). Although poverty depends on the socio-cultural and political system of a particular geographical location, poverty is measured as low social and income status, low educational status and unemployment (Patel & Kleinman, 2003). Patel and Kleinman (2003) reviewed 11 studies on the relationship of poverty and mental disorders. Poverty was strongly associated with poor physical health and mental disorders. Poverty- related issues (e. g., limited access to health care resources and high health care costs) have been associated with worsened health conditions (e.g., physical illness, mental disorders and co-morbidity). A low level education was the most consistent indicator of poverty. Longitudinal studies on the associations of mental disorders, physical illness and poverty are recommended to pinpoint specific risk factors for health conditions and address the poverty issues associated with these health conditions (Lund et al., 2010; Patel & Kleinman, 2003).

Family income plays an important role in determining the health outcomes of children throughout their development into adulthood. Poverty in childhood has a negative effect on the child's health that continues into adulthood. Children from marginalized family backgrounds have an increase in physical illnesses (e.g., hypertension), mental disorders (e.g. depression) and premature deaths in their adult lives. Additionally, poor children have an increased tendency to smoke and to have poor mental and physical health as adults (Gupta, de Wit, & McKeown, 2007). Contrary to the report of Gupta et al. (2007), Roy-Byrne, Joesch, Wang, and Kessler (2009) found that socioeconomic status was not associated with physical and mental health services use among 1,772 participants with mood and anxiety disorders. Age, gender, marital status and race-ethnicity were significant predictors of mental health services use. Poor health outcomes of individuals in low socio-economic status were more likely due to chronic stress rather than due to the varied quality of treatment and/or services (Roy-Byrne et. al., 2009).

A significant relationship between socio-economic status and health services use is a consistent finding in many studies. Disparities related to demographic factors such as age, gender, marital status, race, ethnicity, and education level are predictors of poverty and warrant further research to mediate the effect of socio-economic status and health services use in improving health outcomes.

Perceived Health Status. Perceived health status affects health behaviors and health outcomes (Rahmqvist, 2001; Weigers & Drilea, 1999). Javier, Huffman, Mendoza, and Wise (2010) examined usual source of care, health services use and perceived health status of children with special needs (N=1,404). A lack of health care insurance and a usual source care, no physician visits, fewer emergency room visits, and poor to fair perceived health status were more likely to be reported among children from immigrant families than the children from nonimmigrant families. Additionally, those children belonging to undocumented families had decreased health care access and use as well as poor health status. Language barriers, insurance policies, poverty status, ethnicity, and citizenship status were possible reasons for lack of health care insurance and decrease use of health care services (Javier et al., 2010). These findings support the relationship between perceived health status and poor socio-economic conditions.

Rabin et al. (2009) reported perceived health status correlated with chronic disease and increase morbidity and mortality in adults younger than 65 years. Age and race did not explain a significant decline in perceived health status. However, education and poverty reduction were identified as possible determinants of improved health outcomes. Al-Windi (2005) reported that life satisfaction, the number of symptoms and depression were predictors of perceived poor health among 470 multi-ethnic Swedish patients using primary health care practices. Perceived health status had stronger correlation with mental disorders than physical illnesses. People with mental disorders were more likely to have poorer perceived health status than people with physical illness. Prospective studies on the etiological background of perceived health and its association with demographic factors and medical conditions are suggested routes for further investigations (Al-Windi, 2005).

Bethel, Foreman, and Burke (2011) examined the association of perceived health status and chronic illness. Most of the respondents reported very good to excellent perceived health status (52.3%). Perceived health status, number of chronic diseases and disability status were the independent variables while the three natural disaster preparedness plans were the dependent variables. Natural disaster (e.g., disease pandemic, hurricanes, tornadoes, fire) preparedness plans included presence of four necessary household items (e.g., water, radio, flashlight, and food), an emergency evacuation plan, and a 3-day supply of medications. The researchers purported that U.S. respondents (N=37,303) with fair/poor perceived health status and multiple chronic diseases were more likely to have 3-day supply of medications but less likely to have the four necessary household items and the emergency evacuation plan leading to greater vulnerability and poorer health outcomes.

The association of perceived health status and health conditions was the main focus of these studies. The impact of education level, health care practitioner's characteristics, and racial/ethnic disparities on perceived health status has not been studied. Research examining the relationships of perceived health status, usual source of care and health outcomes is limited. Prospective studies examining these relationships are needed to identify strategies to improve health outcomes.

Health Attitudes. Consistent with the BMHSU model, health attitudes includes opinions about health insurance coverage and the decisions to seek treatment. Health attitudes about insurance coverage and medical treatment needs impact health services use. Having adequate health insurance coverage assures an immediate and appropriate health care delivery while having limited or no health insurance coverage leads to discontinuation of health care services among U.S. non-institutionalized individuals with Medicaid (N=6,247). A trusting patient-health care provider partnership and adequate health insurance can contribute to establishing a usual source of care that supports continuity of care and better patient outcomes. No insurance coverage may lead to inpatient or emergency department use. Quality of health care delivery may be compromised due to disruptions in health care insurance coverage, multiple variations of health care providers and restrictions in the usual source of care (Benerjee, Ziegenfuss, & Shah, 2010). Health insurance coverage is essential to access for care yet due to high costs of health care many people with serious medical conditions have inadequate health insurance coverage which limits their access to health care services use (Kass et al., 2007). The strength of Benerjee et al. (2010) and Kass et al. (2007) studies is the adequacy of sample size. Findings from these two studies demonstrated health insurance coverage was associated with medical conditions. However, the focus on health attitudes was not given an attention so little is known about the relationship of health attitudes to health services use and health outcomes.

Cohen (2009) explored the attitudes toward health insurance and access to healthcare among the 25 million U.S. civilian non-institutionalized adults age 18 and over who participated in the Medical Expenditure Panel Survey (MEPS) 2006. According to the U.S. Census Bureau (2010), in 2006 the U.S. population was estimated at 298,593,212. Hispanics were more likely to indicate they were healthy, had no need for health insurance and health insurance was not worth the cost than White non-Hispanics and Black non-Hispanics. Furthermore, males who had less than 12 years of education, a low income, and were uninsured also reported being healthy, no need of health insurance and health insurance was not worth the cost. These individuals were also less likely to report ambulatory health care visits or inpatient stays (Cohen, 2009).

Negative attitudes about insurance coverage can have an impact on one's health. People without health insurance are less likely to use preventive health care services, thus decreasing the likelihood of early recognition of health problems. As new regulations regarding access to health care are implemented, studies are needed to determine if an increase in access to health care improves attitudes about the health insurance and health outcomes while decreasing health care disparities.

Enabling Resources

Usual Source of Care. Provider types such as the kind of facility and the site's health care providers are components of the construct of usual source of care in this study. Self-reported sites for medical care are considered the usual source of care in this study. Examples of medical sites are community clinics, emergency rooms, hospital clinics, sheltered-based clinics and street outreach teams (Garibaldi et al., 2005). In a MEPS study, usual source of care is assessed by asking the respondents the type of provider (e.g. facility, person, person in the faculty) hospital/outpatient) and the specialty of the health care practitioner (e.g., General/Family Practice, Internal Medicine, Pediatrics, Obstetrics/Gynecology, Surgery, Chiropractor, Nurse, Nurse Practitioner, Physician's Assistant, Other Non-MD Provider, Cardiologist, Doctor of Osteopathy, Endocrinologist, Gastroenterologist, Geriatrician, Nephrologist, Oncologist, Pulmonologist, Rheumatologist, Psychiatrist/Psychologist, Neurologist, Alternative Care Provider). Follow-up questions are asked regarding the characteristics of the health care providers (Weinick, Zuvekas, & Drilea, 2006).

Disparities in health, usual source of care and health service use existed among eligible male veterans (N=3227) in the Veterans Administration (VA) health care system. The usual source of care included the emergency department, ambulatory care, and VA and non-VA health facilities. Providers of health care included attending physicians, resident physicians, nurse practitioners, or other health care providers. Blacks were likely to have a usual source of care while Asian/Pacific Islanders were less likely to report their usual provider of health care. Racial-ethnic disparities in usual source of care were evident (Washington et al., 2005).

A study on the changes in usual source of care used a cross sectional data from the 1998-1999 Community Tracking Household Survey (N=48,720) conducted in a large metropolitan area. Respondents without usual source of care (n=6,627) were more likely to be White, young, male, unmarried, high school educated, and less likely to have private insurance. A researcher suggested that future studies examine the influence of the characteristics of the people with and without insurance coverage as insurance coverage was not found to be different between individuals without usual source of care and those with a change in usual source of care or continued usual source of care (Smith & Bartell, 2004).

Numerous studies have been conducted on usual source of care because of its association with health related issues. However, the concept of usual source of care is complex with no universally accepted description. The concept of usual source of care has been used interchangeably with access to care and location of health care services (Weinick et al., 2006).

Studies on usual source of care focused on variations among racial/ethnic groups. Studies on usual source of care that identify the types of healthcare facilities and providers that would best serve all racial/ethnic groups at all socio-economic levels were recommended (Richardson & Norris, 2010). The samples in most studies on usual source of care were Veterans homeless and older people, and people living in a large geographical location. Research on the usual source of care using a sample of adults with different health conditions particularly those with mental disorders and co-morbid mental disorders and physical illness is warranted.

Personal/Family Resources

Insurance Status. Financial barriers such as unaffordable health insurance or medical payments are major issues in mental health services use. Having no insurance was associated with persons age 17-24 years, of minority racial-ethnic background, unemployed, smoking, poverty, less than 12th grade education and poor health status among young U.S. adults (N=9,004). After controlling for age, race, ethnicity, employment, smoking, income, education and health status, lack of insurance significantly increased likelihood of mortality. An alternative access to medical care (i.e., community health centers) for the individuals without insurance and advocating a universal insurance coverage would be possible resolutions to decrease mortality and improve health outcomes (Wilper et al., 2009). The presence of chronic and treatable health conditions was not delineated as a cause of mortality in Wilper's study. Insurance and other demographic factors are known to be additional causes of mortality. Inclusion of various health conditions would strengthen a study on the association of health insurance with mortality.

Cheng (2005) studied the impact of welfare reform, health and insurance status on welfare recipients' (N=1,259, ages 18-64) health access. Hispanics were less likely to visit a physician, use prescription medication or visit a dentist than non-Hispanics Whites. Recipients of Temporary Assistance to Needy Families (TANF) perceived their health as poor or fair but did use some type of health service. Use of health care services was dependent on insurance. Non-Hispanics Whites were more likely to be insured than other racial/ethnic groups. Race/ethnicity, health insurance status and welfare policies were found to have significant effects on health care services use after controlling for prior health care services, health status and demographic characteristics (Cheng, 2005).

Similarly, health insurance was found to be a predictor of patients (N=1414) use of medical and chiropractic physicians among medical and chiropractic patients. Chiropractors provided treatment for wide variety of medical conditions including depression and other conditions that require prescription medications. Individuals with public or private insurance were more likely to consult medical providers while those who paid out of pocket were more likely to consult chiropractors (Legorreta et al., 2004; Sharma, Haas, & Stano, 2003).

An ethical dilemma is often encountered when political actions involve welfare reform and the regulation of health care and insurance coverage. Studies involving health promotion and illness prevention in low income families could clarify political issues and serve as a basis for meeting the health care needs of low income families. Attention to the health care policies on financing mental health services and an increase of community treatment centers may lessen the barrier in mental health service use (Herson & Snyder, 2011; Monheit, Cantor, DeLia, & Belloff, 2011; Woodward, Dwinell, & Arons, 1992).

Most studies on insurance explored the association of insurance coverage with the type of medical provider. Studies that examine the relationships of health insurance, the types of medical providers and health outcomes among individuals with mental disorders are needed.

Health Care Practitioners' Characteristics

Health care provider and client concordance in race/ethnicity has an impact on individuals seeking health care service use for physical and/or mental problems. Allowing time for patient-health care providers for conversation between patients and health care providers facilitates attention not only to physical needs but also mental health needs. In addition, having adequate training for health care providers on assessment, diagnosing and treating patients with physical and mental disorders may alleviate barriers related to health care providers' attitudes related to the stigma of mental illness and improve health outcomes (Hahm, Speliotics, & Bachman, 2008; Ndetan et al., 2010). The complexity of mental disorders and factors inherent in the therapeutic rapport between individuals seeking health care services and health care providers presents issues if providers are not skilled on assessment, interview process and diagnosing of mental disorders and co-morbidity (Desai, Rosenheck, & Craig, 2005; Flynn, Budd, & Modelski, 2008).

Cooper and Powe (2004) examined studies on health care provider-patient racial-ethnic concordance (N=8). Racial and ethnic disparities were evident in few of the studies they reviewed. Minority patients were treated by health care providers who were of different racial and ethnic background. Studies on the impact of health care provider-patient race-ethnic concordance to health services use and health outcomes were limited.

The primary care physician’s office is a common place for studies on health care provider-patient racial-ethnic concordance (Cooper & Powe, 2004).

Minorities are significantly more likely than Whites (n=3,488) to perceive biases in medical treatment. They may feel that they would receive better medical care if they belonged to a different race/ethnic group and would be treated with respect if they were of a different race and ethnicity and could speak English well (N=6,299). Differences in demographic factors, usual source of care, health status and concordance in patient-provider characteristics have not been well explained. Future directions for research include addressing these differences (Johnson, Saha, Arbelaez, Beach, & Cooper, 2004).

The client’s presentation of symptoms, the clinician’s degree of competence, and organizational characteristics affect the diagnosis of mental disorders and substance abuse. The client’s characteristics pertinent to their biophysiological status and the severity of their disease are important aspects that influence the diagnosis of mental disorders. Studies on diagnostic inaccuracy for substance abusing clients with mental disorders have provided insights to the need of consistent diagnostic practices. Some recommended diagnostic practices in providing treatment consistency for clients with mental disorders and substance abuse include using comprehensive and detailed evaluations on mental health and substance abuse history, performing structured diagnostic clinical interviews and making accurate diagnostic differential (Kline & Mehler, 2006).

Racial-ethnic disparities could be diminish by advocating for health care provider diversity in the health care arena, instilling cultural competency among the health care providers and augmenting funding resources on minority education. Future studies should explore the effects of not only provider-patient racial-ethnic concordance; these studies should include provider-patient gender concordance which has not been studied at all.

Community Resources

Adequacy of community resources is necessary to meet the treatment concerns regarding the severity and chronicity of mental and physical illness. The choice of treatment must be in accord to the client's priorities and clients' presentation of symptoms (Flynn et al., 2008).

Usual Source of Care Location. The location of the usual source of care can present a challenge. Potential barriers to clients' accessibility to health care services include a lack of financial resources, policies, laws, certification for mental health and substance abuse, case management, integration of mental health and substance abuse care, and scarcity of mental health care experts, community outreach programs, and public transportation. The merging of funding sources, policies, services, education, training for health care providers and utilization of peer recovery models may be the future approaches to proper treatment of mental health disorders with co-morbidity issues and reduce barriers to health care services use and accessibility (Ouimete et al., 2007; Stefanacci & Podrazik, 2005).

Garibaldi et al. (2005) surveyed 531 homeless adults with self-reported a co-morbid mental disorder and physical illness to examine differences in accessing health care services. Self-reported sites for medical care were considered the usual source of care. Medical sites included community clinics, emergency rooms, hospital clinics, shelter-based clinics and street outreach teams. Community clinics were used as the usual source of care for medical care for both older (>50 years, n=457) and younger (<50 years, n=74) adults. However older adults used more the shelter-based clinics and the street-based outreach programs than their younger counterparts. The researchers suggested augmenting integration of mental health and physical services to improve health outcomes among young and older homeless adults (Garibaldi et al., 2005).

Research comparing the use of different locations for usual source of care (e.g., emergency room vs. urgent care) and its effect on health behaviors and health outcomes is much needed focus (Weinick, Burns, & Mahrotra, 2010). Future studies on differences of community resources between individuals with mental disorders and individuals without mental disorders are warranted. Additionally, the effects of the community resources on health outcomes would be a direction of study to address health service use disparities.

Transportation Mode. Individuals with disabilities, especially for those with mental disorders are less likely to have their own transportation. Shook (2005) assessed the transportation barriers among 75 adult patients in a federally funded community health center and found that lack of car ownership, longer distance travel, and reliance on public transportation were significantly related to decreased health services use and poorer health outcomes. Transportation barriers and lack of health insurance coverage were presented as major issues in using the health services especially for people with chronic medical condition (Shook, 2005).

In a study on older patients with bipolar disorder (N=58), researchers reported that 31% of the sample relied on public transportation (i.e. Veterans van) for medical appointments and 22% had issues in accessing medical care. Disparities related to living situations (i.e., being alone), transportation mode (i.e. relying on public transportation), and health care services (i.e., accessing health care) increased their vulnerability. Suggestions to improve health outcomes among people with a mental disorder and physical illness included addressing transportation barriers, the implementation of medical care models, the use of technology (i.e., telepsychiatry), and research on development of treatment models (Kilbourne et al., 2008).

Convenience samples of older adults, Veterans, and homeless individuals were used in most studies about community resources (i.e., usual source of care location and transportation mode) and their relationship to health services use. The link between community resources and health outcomes remained unclear and a topic for future research. Furthermore, small sample sizes were a pattern in most studies on health services use and access thus presenting a limitation. Future studies must address these issues (i.e., diverse population, large sample size) to promote health and reduce health disparities.

Health Behaviors

Health behaviors include health services use and health practice. In this study, health behavior services use includes the total number of reported visits to outpatient and office-based clinics for 2006. The health practice chosen for this study was the participant’s smoking habit.

Health Services Use

A study on predictors of recent mental health service use reported interesting findings on the importance of health care providers on individuals with medical conditions. The strongest predictor of recent mental health service use in 240 adult medical outpatients was the referral from health care provider for mental health services (e.g., psychotropic medication, psychotherapy or combination of psychopharmacology and psychotherapy). The trust and respect of patients for the health care providers who referred them to mental health services has been implicated as one of the reasons for adherence of medical patients to access mental health services referred by their provider. Other predictors of recent mental health service use included the perceived need for mental health services, prior use of mental health services, and the frequency of medical appointments. A recommendation for future research includes exploring the relationship of the characteristics of the providers (i.e. specific discipline) making mental health referrals and patient compliance to accessing these services. Specific disciplines (e.g., physicians, nurse practitioners, and social workers) have been associated with patient compliance to accessing recommended health care services (Ledoux, Barnett, Garcini, & Baker, 2009).

Health care access and health care services utilization were examined in a study of three generation Mexican Americans (N=4,382), non-Hispanic Blacks (N=4,138), and non-Hispanic Whites (N=4,594). All three generations of Mexican Americans were more likely to have low household income and use public health insurance coverage than non-Hispanic Whites. After controlling for socioeconomic factors and insurance status, the first generation Mexican Americans had the highest rate of being uninsured and the lowest level of health care access and health care services use. Cultural perspectives and differences were attributed to health care services use. Language issues, lack of health insurance, and difficulty with transportation and paying bills were identified as additional barriers to health care services use (Burgos, Schetzina, Dixon, & Mendoza, 2005).

In the study of 363 homeless adults (predominantly young African American males with a prison history, chronic alcohol dependence, no regular source of care and currently receiving public benefits), researchers found that participants were more likely to seek care for conditions that have less immediate impact but with more serious long term consequences (e.g., high blood pressure; tuberculosis exposure) than those conditions with more immediate impact (e.g., skin/leg/foot problems; vision impairment). The use of health care was not associated with mental illness and substance abuse. Satisfaction with care and perceived health status were positively associated with having a regular source of care (community clinic or private physician). Homelessness was not a barrier in obtaining health care services use as long as the homeless person believed that the care was important (Gelberg et al., 2000).

In a cross sectional study of 1001 Hispanic respondents participating in the Commonwealth Fund Minority Health Survey, the use of the health care system was associated with having poor health status, a regular source of care, and health care insurance coverage. The strongest determinants of number of visits within 12 months were having a self-reported health problem; being female; having a large family size; being foreign born; having health insurance; and having perceptions that better care is received if race is non-Hispanic. People with health problems that interfered with their work, school, housework and other activities were more likely to use emergency services. Individuals with less than high school education and less than $25,000 annual household income were less likely to use preventive care (Wagner & Guendelman, 2000).

Vega, Kolody, and Aguilar-Gaxiola (2001) compared the mental health services use between foreign-born and U.S.-born Mexican Americans with psychiatric disorders

(N=507). Compared to the foreign born Mexican Americans, U.S.-born Mexican Americans used more mental health specialists such as psychiatrists, psychologist, social workers and other mental health providers. The foreign-born Mexican Americans used more informal providers such as folk healers, and natural healers than U.S.-born Mexican Americans. Significantly, U.S.-born Mexican Americans used one to three provider types compared to foreign born Mexican Americans. Being female and knowing where to obtain treatment were two statistically significant predisposing factors to seeking mental health providers (Vega et al., 2001).

In a study of 1,772 National Comorbidity Survey Replication respondents with anxiety and mood disorders, age, gender, marital status and race-ethnicity were strong predictors of mental health services use. Education and income were weak predictors of mental health services use. Most of the participants were age 30-44 (n=639, 34.5%), females (n=1196, 64.8%), married (n=888, 48.7%), non-Hispanic Whites (n=1,272, 74%), had insurance (n=1,551, 67%), 12 years of education (n=539, 31.5%), and high family income (n=576, 32%). Non-Hispanic Whites were more likely had received mental health services than Hispanic and non-Hispanic Blacks. The participants in low-average family income and education lower than 12 years were less likely had mental health and general medical health services but this result was found to be statistically significant. Variations in the types of treatment settings, classification of psychotropic medications, and the quality of health care services were possible reasons for mental health services use than variations in education or socio-economic status (Adler & Stewart, 2010; Roy-Byrne et al., 2009).

Although most studies have representative sample of Hispanics, an identified need for more research exploring the ongoing issue of availability and accessibility of diversified health care resources among the U.S. adult population lingers. Research on differentiating the health services use between individuals with mental disorders and those without mental disorders would facilitate understanding of health outcomes among this population.

Health Practice

Smoking. Smoking is the most definite modifiable health risk factor that has a negative association with health outcomes. Finney Rutten, Wanke, and Augustson (2005) examined the association of health services use, usual source of care, perceived health status, and smoking status (N=6,149). Non-smokers were more likely to have insurance coverage; see a health care provider regularly; report very good to excellent perceived health status and have fewer depressive symptoms. The researchers' findings supported that smoking has negative effects to usual source of care, health care services use and perceived health status. Trosclair and Dube (2010) concurred that current smokers were more likely to have mental disorders and nicotine dependence. Smoking cessation has been suggested as an effective interventional strategy for mental health promotion (Shimada, Lord, Yoshida, Kim, & Suzuki, 2007; Von Ah, Ebert, Ngamvitroj, Park, & Kang, 2004).

Health Outcomes

In this study, health outcomes include physical health status and mental health status. Population characteristics (predisposing factors and enabling resources) and health behaviors (health services use and smoking) influence health outcomes.

Physical Health Status

Dawson, Grant, Chou, and Stinson (2007) examined the relationship of partner alcohol problems and health outcomes among U.S. women age 18 and older (N=11,683). The Short Form 12 items (SF-12) was used to measure physical health status. Women with partner alcohol problems had a greater risk for multiple physical health problems and poorer health status than those women without partner alcohol problems. One surprising finding was that there were no differences in emergency department use or hospitalizations among women with partner alcohol problems and women without partner alcohol problems. Further exploration of the risk factors of women with partners who have abusive behaviors was suggested to improve health outcomes of this population (Dawson et al., 2007).

Everett, Mahler, Biblin, Ganghuli, and Mauer (2008) reported that people with mental disorders have a higher mortality rate than the general public, however the cause of deaths are usually preventable and manageable with positive health habits. Heart diseases, cancer, lung conditions, stroke, accidents and diabetes are some of the physical conditions known to cause premature deaths. Inadequate health care facilities, lack of health insurance coverage, and incompetent health care providers were listed as some of the barriers to positive health outcomes. Effective interventions for positive health outcomes include smoking cessation, healthy lifestyles, and mental health policies initiatives (Everett et al., 2008).

Studies showed that presence of physical illness, demographic factors (e.g., gender, usual source of care, insurance status), and health care practitioner’s characteristics were predictors of physical health status. Exploration on the association of other socio-demographic factors (e.g., health attitudes, perceived health status, health behaviors, usual source of care) with physical health status has not been well researched. Further investigation of the relationship of socio-demographic variables such as health attitudes, perceived health status, health behaviors, usual source of care and various types of physical health conditions would provide a better understanding of physical health status.

Mental Health Status

Timko and colleagues (2006) focused on health outcomes, health care utilization and costs among 230 Veterans. Veterans with mental disorders and substance abuse living in the community residential facilities were found to have better mental health outcomes (i.e. less severe psychiatric symptoms and substance use; less health care cost and utilization of services) compared to those in the hospital acute care facilities. Patients in the hospital acute care facilities had more outpatient mental health follow-up visits (mean=96.42, SD=88.59) and more costly mental health follow-up visits than the patients in the community residential facilities (Timko, Chen, Sempel, & Barnett, 2006). In addition, veterans with more severe mental disorders and substance abuse and in high service intensity programs had higher mental health care use in both inpatient and outpatient treatment settings than those in a less severe and low service intensity group (Timko et al., 2006; Chen, Barnett, Sempel, & Timko, 2006).

In a randomized controlled trial (N=152), patients with severe and persistent mental and substance use disorders were found to have a significant increased use of outpatient management contacts and medication visits. Bipolar patients with substance use disorders had better mental health outcomes than those with schizophrenia or schizoaffective with substance use disorders (Xie, McHugo, Helmstetter, & Drake, 2005). The integration of physical and mental health services is a recommended strategy to provide holistic care and improve both physical and mental health status. Future studies must include the effects of integrated health care service to health outcomes (Anderson et al., 2010).

A significant association of health services use and mental health status is evident. Studies indicate that the severity of having a mental health condition affects health services use and mental health status among individuals with mental disorders. However, studies that examine the relationships of health conditions, usual source of care, insurance status, health care practitioner's characteristics, health attitudes, perceived health status, health behaviors with mental health status are limited.

Summary

Most studies reviewed used varied sample size (e.g., 8-531) from convenience samples to large samples (e.g., ≤1,000 -25 million) from national surveys (e.g., Medical Expenditure Panel Survey, National Comorbidity Survey Replication). Studies with small sample size were valuable in highlighting the needs of specific population (e.g., children, older adults, homeless people, Veterans). Studies from national surveys with large sample size were useful in pointing out the usual source of care and health conditions of individuals with mental health conditions across the nation.

Most studies on mental health were descriptive and often suggested the need for interventions. However, interventional research was limited. The literature identified a gap on the relationships of health conditions, socio-demographic factors, health attitudes, perceived health status, usual source of care, health services use, smoking, and health outcomes. Most studies examined the relationships of a few of these constructs but there was no study that examined the relationships of all of these constructs (i.e., health conditions, socio-demographic factors, health attitudes, perceived health status, usual source of care, community resources, insurance status, health services use, smoking, health outcomes). Additionally, there was no study that examined the influence of these relationships to health behaviors and health outcomes and used a theoretical model (i.e., Behavioral Model of Health Services Use). There were limited studies on the differences of usual source of care, physical health status and mental health status between individuals with mental disorders and those without mental disorders. A study with a focus on individuals with self reported mental disorders and their perceived status, usual source of care, and health outcomes adds to the limited number of reports on these aspects of need.

CHAPTER III

Methodology

This chapter describes the research design used in this study. Assumptions about the data are presented. Data sources, sample, measurements, and analytical approaches are discussed.

Research Design and Data Sources

This study is a secondary analysis of existing data collected from the national public data base Medical Expenditure Panel Survey (MEPS) of 2006. The MEPS was initiated in 1996 by the Agency for Healthcare Research and Quality (AHRQ) to collect data annually on financing and utilization of medical care by the general population in the United States. The MEPS provides the most complete national database on health conditions, access to care, insurance status, health services use, and health status of the American populace. The MEPS consists of two main components, the household component and insurance component. The Household Component (HC) contained data from a sample of individuals, families and their medical providers. The Insurance Component (IC) included data from employers about their health insurance. MEPS HC-104 contained a list of medical conditions in 2006 (MEPS Survey Background, 2010). Health conditions were selected from MEPS HC-104 2006. Survey questionnaires related to specific topics such as access to care, health insurance, health status and hospital visits were used in MEPS HC-105. MEPS HC-104 and the 2006 Consolidated Data File of Household Component (HC-105) were used in this study.

The National Health Interview Survey, conducted by the National Center for Health Statistics, was used in a sampling frame that consisted of a U.S. civilian non-institutionalized population for MEPS. Data were collected using computer-assisted personal interviewing (CAPI) technology in a 2.5 year period. Interviews were administered in person and ranged from one to four hours with an average of 90 minutes depending on the number of persons per household and their health care use. An overlapping panel design was used by MEPS in the data collection. Each Panel consisted of five rounds of interviews over the 2.5-year period of data collection starting from January 1st to December of 31st. Panel 10 and Panel 11 were used in the 2006 data collection period. The two Panels were indicated by letters X and Y. Panel 10 was denoted by X and Panel 11 was denoted by Y. Both Panel 10 and Panel 11 have corresponding rounds of interviews. Panel 10 consisted of Rounds 3, 4 and 5 and Panel 11 consisted of Rounds 1, 2 and 3. The number after each variable name represented the rounds when the data were collected (MEPS-HC Sample Design and Collection Process, 2010). Panel 10 (X) and Round 4 and Round 2 (42) were used in this study to have consistency of the variables collected in the same time period.

Data collected in MEPS 2006 was used in this study because this time period had the largest sample size and reporting units as compared to the data collected between 2004 and 2008. All of the variables used in this study were available during this data collection. The structure of the Behavioral Model of Health Service Use (BMHSU) was used to present the constructs, variables and their operational definitions and the specific data source; see Table 3.1. See Appendix A for the detailed description of variables categorized according to the concepts of the modified version of BMHSU.

Table 3-1

*BMHSU Constructs, Variable Operational Definitions and Specific Source for MEPS Data**

BMHSU Constructs	Variable Operational Definition	Specific Data Source
Population Characteristics Predisposing Factors		
Health Conditions	***Mental Disorder***	MEPS HC-104
	Schizophrenia	CCCODEX 659
	Mood disorder	CCCODEX 657
	Physical Illness	MEPS HC104
	Hypertension	CCCODEX 098
	Hyperlipidemia	CCCODEX 053
	Co-morbid Mental Disorder And Physical Illness	MEPSHC-104 CCCOODEX
Demographic Factors	Age (18-24, 25-44 and 45-65 years old)	MEPS HC-105-RE AGE42X
	Gender (Male or Female)	MEPS HC-105-RE SEX
	Marital Status (Married, Widowed, Divorced, Separated, Never Married, and Under 16-inapplicable.	MEPS HC-105-RE MARRY42X
	Race (Whites, Black, American Indian, Asian. Native Hawaiian or Pacific Islander, Multiple Races)	MEPS HC-105-RE RACEX

(Table 3-1 Continues)

(Table 3-1 Continued)

BMHSU Constructs	Variable Operational Definition	Specific Data Source
	Ethnicity (Hispanic, Not Hispanic)	MEPS HC-105-RE HISPANX
	Education (No Degree, GED, High School Diploma, Bachelor's degree, Master's Degree, Doctorate Degree, Other degree and Under 16-inapplicable	MEPS HC-105-RE HIDEG
Socio-Economic Status	Poverty Status (Poor, Near-poor, Low income, Middle income, High Income)	MEPS HC-105 Constructed POVCAT06
Health Attitudes	Health Attitudes toward health insurance and decision factor to purchase health insurance or to use health services (5 points Likert scale Disagree Strongly, Disagree Somewhat, Uncertain, Agree Somewhat, Agree Strongly)	MEPS HC-105-SAQ (HEALTH ATTITUDES (Merged ADOVER42 ADINSA42 ADINSB42 ADRISK42)
Perceived Health Status	Perceived Health Status Rate of General Health (Excellent, Very Good, Good, Fair, Poor, Inapplicable)	MEPS HC-105-CE RTHLTH42
	Perceived Mental Status Rate of Mental Health (Excellent, Very Good, Good, Fair, Poor, Inapplicable)	MEPS HC-105-CE MNHLTH42
Enabling Resources ***Usual Source of Care***	Provider Type (Facility, Person, Person in Facility Provider	MEPS HC-105-PV PROVTY42

(Table 3-1 Continues)

(Table 3-1 Continued)

BMHSU Constructs	Variable Operational Definition	Specific Data Source
Health Care Practitioners' Characteristics	Health Care Practitioner's Gender (Male, Female, Unknown)	HC-105-AC GENDRP-42
	Health Care Practitioner's Race	HC-105-AC
	(Hispanic	HSPLAP-42
	White,	WHITPR-42
	Black/African American,	BLCKPR-42
	Asian	ASIANP-42
	Indian/Native American/Alaska	NATAMP-42
	Other Pacific Islander,	PACISP-42
	Some other race)	OTHRCP-42
	Health Care Practitioner's Ethnicity (Hispanic-Yes/No)	MEPS HC-105-AC HSPLAP42
Personal/ Family Resources	Insurance status Presence of health insurance Coverage (Any Private, Public only; Uninsured)	MEPS HC-105 Constructed INSCOV06
Community Resources	Usual Source of Care Location (Office, Hospital Clinics (not ER), Hospital ER	MEPS HC-105 Constructed LOCATN42
	Transportation Mode (Self-Driven, Somebody Driving, Use of Public Transportation, Walking)	MEPS HC105-AC GOTOUS42
Health Behaviors		
Health Services Use	Total Number of Office-Based Clinic Visits for 2006	MEPS HC-105 Health Services OBTOTV06

(Table 3-1 Continues)

(Table 3-1 Continued)

BMHSU Constructs	Variable Operational Definition	Specific Data Source
	Total Number of Outpatient-Based Clinic Visits for 2006	MEPS HC-105 Health Services OPTOTV06
Health Practice	Smoking (Currently Smoke-Yes or No)	MEPS HC-105-SAQ ADSMOK42
		(Table 3-1 Continues)
Health Outcomes	Physical Health Status	MEPS HC-105-SAQ SF-12 (PCS42) (Physical Component Summary)
	Mental Health Status	MEPS HC-105-SAQ SF-12 (MCS42) (Mental Component Summary)

* MEPS 2006 HC-105 Consolidated Data

The medical conditions were recorded and coded using International Classification of Diseases, Ninth Revision, Clinical Modification (ICD-9-CM). ICD-9-CM was the official system for assigning codes to diseases or diagnoses in the United States (Centers for Disease Control and Prevention, 2010). ICD-9-CM condition codes have been aggregated into similar meaningful categories known as Clinical Classification Codes (CCC) (MEPS Medical Condition, 2010). The medical condition of 2006 HC-104 CCCODEX data file contained clinical diagnostic codes and was used to identify subjects for this study. The numbers after the data source on CCCODEX represent the ICD-9-CM or the codes to the disease or diagnoses chosen for the study.

MEPS HC-105 2006 full year consolidated data file was used as the main data source of the study variables. Subjects were selected for this study with the use of a unique identifiable variable (DUPERSID). DUPERSID contained the person's dwelling unit identification and person's number (N=34,145). The subjects selected from the medical condition of 2006 HC-104 were matched and merged with the subjects in MEPS HC-105 2006 full year consolidated data file (N=622). The main variables and associated variables were selected and presented according to the category of the concepts of the modified BMHSU. See Appendix A for detailed description of variables and coding.

Sample

Sample criteria were set according to the category of the health conditions. The health conditions were categorized according to the disorder/illness group. The first category consisted of the mental disorder (MD) group. The mental disorder group consisted of individuals with schizophrenias, psychoses, and mood disorders but without cancer, dementia or emergent conditions or surgery or fractures (n=114). The second category consisted of the physical illness (PI) group. The physical illness group consisted of individuals with hypertension (high blood pressure) and hyperlipidemia (high cholesterol, high levels of lipids) but without any other physical conditions (n=469). The third category consisted of the co-morbid (CM) mental disorder and physical illness group. The co-morbid group consisted of individuals with both a mental disorder and a physical illness (n=39). Mental disorders and physical illnesses were determined according to ICD-9-CM. The health condition categories and total number of subjects are summarized in Table 3.2.

Table 3-2

Health Condition Categories

Health Condition Category	n	%
Mental Disorder (MD)	114	18
Physical Illness (PI)	469	76
Co-morbid Mental Disorder and Physical Illness (CM)	39	6

No individual identifiers were used in the study. The inclusion criterion was being a U.S. civilian non-institutionalized adult aged 18 and above but less than 67 years regardless of gender, educational status, marital status, and race-ethnic background. To be included in the 2006 MEPS study, the participant had to be at least 65 years old; some participants were 65 years at the start of the study but at the time of their enrollment into the study, they were 66 years of age. The individuals with mental disorders have self-reported schizophrenia, psychoses, and mood disorders. These mental disorders were selected due to their chronicity and severity (Parabiaghi, Bonetto, Rugerri, Lasalvia, & Leese, 2006). The individuals without mental disorders have self-reported physical illnesses such as hypertension (high blood pressure) and hyperlipidemia (high cholesterol). These selected physical illnesses are costly, chronic, life threatening conditions but are treatable and are not considered terminal illnesses (MEPS, 2010).

Criteria for exclusion were a) age 17 and below; b) age 67 and above; c) psychiatric diagnoses such as those commonly diagnosed in children (i.e., oppositional defiant disorder and conduct disorder, developmental disorders); d) vague psychiatric diagnoses (i.e., miscellaneous mental disorders, suicide and intentional self-infliction, history of mental health); and e) other psychiatric diagnoses categorized as Diagnostic Statistical Manual Fourth Edition Text Revision (DSM IV-TR) Axis II diagnoses (i.e., personality disorders and mental retardation).

Psychiatric diagnoses commonly seen in children ages 17 and below were excluded in the study because of the differences in the assessment, diagnosis, treatment, and mental health services for individuals age 17 and younger as compared to individuals age 18 and older (Calton & Arcelus, 2003; Simonoff et al., 2004). Ages 66 and above were excluded in the study because of the differences in the assessment, diagnosis, treatment and biopsychosocial needs of individuals age 65 and older as compared to individuals below 65 years old (Cummings & Cassie, 2008). Vague psychiatric diagnoses and DSM IV-TR Axis II diagnoses were excluded because these were not considered severe mental disorders. Additionally, other long term, life threatening medical/physical illnesses such as cancer, diabetes, emphysema and stroke were excluded because of the known treatment complexity and illness severity associated with these diseases (MEPS, 2010).

According to Munro (2001), the power of a MANOVA study is difficult to determine because of the number of variables that needed to be estimated. In order to maintain a given level of power, an increase number of dependent variables require an increase in sample size. However, a minimum of 10 subjects per variable is needed to conduct a regression analysis. Using this estimation and basing the sample size determination on the 25 variables for Aim 1 Research Question 4 (A1R4), the minimum sample size for the study is 250 participants. For comparison, the sample size was estimated for an ANOVA analysis for Aim 2 Research Question 2 (A2R2), is there a significant difference in physical health status between individuals with self-reported mental disorders and individuals without mental disorders. Based on A2R2, a minimum of 50 subjects was projected for 3 independent variables and 2 dependent variables. The sample size of this study was 622 participants, far exceeding the minimum requirements for the sample size estimations presented above. Of interest for the national study, Ferguson (2009) notes that small effect sizes are common in social sciences research (Ferguson, 2009; Rosnow & Rosenthal, 2003). The effect size of .15 was obtained for this study with alpha=.05 and power of 0.8.

Measurements

MEPS has established survey questionnaires specific to the topic of this research study. The established survey questionnaires included in the study were the access of care (AC), health insurance (HX), health status (HE), medical provider visits (MV), medical conditions (MD), and satisfaction with their health plan (SP) (MEPS, 2010). See Appendix B for the definitions of terms.

Periodically, MEPS administers a paper questionnaire that includes the adult Self-Administered Questionnaire (SAQ). The SAQ contains questions from several measurements such as The Consumer Assessment of Health Plans (CAHPS), the Short-Form-12 items (SF-12), the Kessler Index (K6) and the Patient Health Questionnaire (PHQ-2). Two supplement questionnaires collected by MEPS interviewers but not used in this study were The 2000 Parent Administered Questionnaire (PAQ) and A Survey about your Diabetes Care (MEPS, 2010). K6 and PHQ-2 were not used as a data source in this study.

The question on smoking (ADSMOK42) was taken from one of the measurements of CAHPS. Participants were asked if they were currently smoking with responses of yes or no. CAHPS is designed to measure quality of care from the respondent's perspectives (MEPS, 2008).

Health Attitudes includes opinions on health insurance and decision factors in purchasing health insurance and use of health services. The health attitude variable was derived from the Self-Administered Questionnaire (SAQ) data on ADINSA42, ADINSB42, ADRISK42 and ADOVER42. ADINSA42 is defined as "healthy enough" and "do not need health insurance". ADINSB42 is defined as "health insurance is not worth the money it costs". ADRISK42 is defined as "more likely to take risks than the average person". ADOVER42 is defined as "can overcome illness without medical help". Initially two variables were merged together (ADINSA42 and ADINSB42) and (ADINSB42 and ADRISK42) based on their relevance to concepts of health insurance and health services use. The reliability of the two variables resulted to .405, however, when all four variables (ADINSA42, ADINSB42, ADINSB42 and ADRISK42) were merged the reliability increased to .611. The four variables (ADINSA42, ADINSB42, ADRISK42 and ADOVER42) were renamed health attitudes (HEALTHATTITUDES). According to George and Mallery (2003), the reliability of .611 with only four items is acceptable. A 5-point Likert scale was used for each health attitude with the higher score indicating an agreement to the item. For example a score of 5 on the item regarding the need for health insurance would indicate that the respondent felt that health insurance is not important. The higher the score of health attitudes meant that the insurance was not needed and not worth the cost. The range of scores for the four items is 0 to 20 (MEPS, 2008).

The variables on health outcomes of this study are the Physical Component Summary (PCS) of the Short Form-12 Items version 2-Imputed (SF-12v2) and the Mental Health Component (MCS) of the SF-12v2 Imputed. The Short Form-12 Items (SF-12) is a widely used measurement for health status. The SF-12 contains twelve questions relevant to the limitations of activities of daily living or ability to do physical activities; the frequency of feeling calm, downhearted, and energized; and overall health. The SF-12 contains two main components, the Physical Component Summary (PCS) and the Mental Component Summary (MCS). The SF-12 has also been preliminary tested for reliability and validity with the 36-item Short Form Health Survey (SF-36) with 2,333 U.S. Americans. A test-retest correlation of 0.89 was reported for the 12-item PCS and 0.76 for the 12-item MCS. In validity tests, the relative validity estimate ranged from 0.43 to 0.93 (median=0.67) for the 12- item PCS and from 0.60 to 1.07 (median=0.97) for the 12-item MCS (Ware, Kosinski, & Keller, 1996). The reliability and validity of SF-12 have been established based on data from 145 homeless people with Cronbach's Alpha of 0.82 for physical health and 0.79 for mental health with comparison estimates from the general population of 0.78 for physical health and 0.73 for mental health (Larson, 2002). In addition, Fleishman (2010) found correlations among the PSC-12 and MCS-12 scales were high (>/=0.84) among 53,399 U.S. respondents. The alpha coefficient for this study is .997, suggesting that the 12 items of SF-12 have high internal consistency.

Data Assumptions

This study has two basic assumptions. First, the Medical Expenditure Panel Survey (MEPS) was administered accurately. Professional coders used the International Classification of Diseases Ninth Revision (ICD-9-CM) for coding the medical conditions (MEPS Medical Condition, 2010). It is assumed that the information on medical conditions coded in the data base has been entered correctly. Second, it is assumed that all participants answered the questions to the best of their ability. Data were taken from a self-report survey completed by respondents (N=622). It is assumed that these respondents gave honest responses related to their health conditions, demographic information, socio-economic structure, health attitudes, perceived health status, usual source of care, health services use, health practice, and physical health status and mental health status.

Data Analysis Procedures

The Statistical Package for Social Sciences (SPSS) Program version 18.0 was used in analyzing the data. Descriptive analyses were first carried out to examine the characteristics of the subjects and group comparisons between individuals with self-reported mental disorders and those without mental disorders. An explorative descriptive analysis was used to describe the relationship of population characteristics (predisposing factors and enabling resources), health behaviors (health services use and health practice) and health outcomes (physical health status and mental health status) of individuals with self-reported mental disorders (MD), physical illnesses (PI) and a co-morbid mental disorder and physical illness (CM). Differences in usual source of care, physical health status and mental health status between individuals with self-reported mental disorders and individuals without mental disorders were also examined using descriptive analyses.

For Aim1Research Question 1 (A1R1) and Aim 1 Research Question 3 (A1R3) a general linear model or multivariate analysis of variance (MANOVA) was used to analyze the relationships of population characteristics (predisposing factors and enabling resources), health behaviors, and health outcomes. For Aim 1Research Question 2 (A1R2) and Aim 1 Research Question 4 (A1R4), a multivariate analysis of covariance (MANCOVA) was used to analyze the relationships of population characteristics (predisposing factors and enabling resources), health behaviors, and health outcomes. For A1R1, population characteristics (predisposing factors and enabling resources) were the independent variables and health behaviors were the dependent variables. For A1R2, predisposing factors were the independent variables, enabling resources were covariates, and health behaviors were the dependent variables. For A1R3, population characteristics (predisposing factors and enabling resources) and health behaviors were the independent variables and health outcomes were the dependent variables. For A1R4, predisposing factors and health behaviors were the independent variables, enabling resources were covariates and health outcomes were the dependent variables.

For Aim 2 Research Question 1 (A1R1), a Kruskal-Wallis one-way analysis of variance was used to analyze the differences in the usual source of care between individuals with self-reported mental disorders and individuals without mental disorders. Health conditions, [mental disorders (MD), physical illness (PI), and co-morbid mental disorder and physical illness (CM)] were the independent variables and usual source of care was the dependent variable. For Aim 2 Research Question 2 (A2R2) and Aim 2

Research Question 3 (A2R3), a univariate analysis of variance (ANOVA) was used to analyze the differences in the physical health status and mental health status between individuals with self-reported mental disorders and individuals without mental disorders. The health conditions (MD, PI and CM) were the independent variables for A2R1, A2R2 and A2R3. The dependent variable for A2R1 was usual source of care, for A2R2 physical health status and for A2R3 mental health status.

In summary, a general linear model or multivariate analysis of variance and multivariate analysis of covariance were used to analyze the relationships of population characteristics, health behaviors and health outcomes. A univariate analysis of variance was used to analyze the differences in the usual source of care, physical health status and mental health status between individuals with self-reported mental disorders and individuals without mental disorders. A significance level of $p<.05$ was used for analysis. All results with $p=<.05$ were considered statistically significant.

Summary

This study was a secondary analysis of existing data collected from the national public data base Medical Expenditure Panel Survey (MEPS) of 2006. The MEPS Household Component (HC-105) 2006 full year consolidated data file was the data source of the study variables. U.S. civilian non-institutionalized adults ages 18 years and above but less than 65 years old regardless of gender, educational status, marital status, and race-ethnic background (N=622) were included in this study. The sample was selected based on the following health conditions: mental disorders (MD), physical illnesses (PI), and co-morbid mental disorders and physical illnesses (CM).

The two assumptions related to the study were presented. A general linear model or multivariate analysis of variance was used to analyze A1R1 and A1R3 while a multivariate analysis of covariance was used to analyze A1R2 and A1R4. A univariate analysis of variance was used to analyze A2R1, A2R2 and A2R3. Results with a significance level of $p<.05$ were considered as statistically significant.

CHAPTER IV

Results

This chapter contains the results of the data analyses. Sample characteristics are described. Descriptive statistics for major study variables such as population characteristics (predisposing factors and enabling resources), health behaviors (health services use and health practice) and health outcomes (physical health status and mental health status) are discussed. Discussion of the results and data analyses are organized according to the two specific aims and their corresponding research questions.

Sample Characteristics

Descriptive statistics that included means (M), standard deviation (*SD*), ranges and frequencies were used to analyze the demographic data. The sample (N=622) was categorized according to the three health conditions: a mental disorder (n=114, 18%), a physical illness (n=469, 76%); and a co-morbid mental disorder and physical illness (n=39, 6%). The ages ranged from 18 to 66 years old. Age was based on the date of birth upon participation of MEPS (January 1st to December 31st2006). The participants must be 65 years at the start of MEPS 2006 study. The mean age of individuals with a mental disorder (MD) was 37 (*SD*=11) years. The mean age of individuals with a physical illness (PI) was 48 (*SD*=10) years. The mean age of individuals with a co-morbid mental disorder and physical illness (CM) was 45 (*SD*=13) years. An ANOVA was used to identify age differences between the three health conditions. There were statistically significant differences in age between the three health conditions, F (2, 619) =46.22, p=.000). Individuals with MD were significantly younger than the individuals with CM (p=.001) and individuals with PI (p=.000). Individuals with PI were significantly older than the individuals with MD. Individuals with PI were older than the individuals with CM but was non-significant difference (p=.200).

A Chi square analysis was used to identify differences in demographic factors between the three groups (MD, PI, and CM). There were statistically significant differences among gender, X^2 (2, N=622) = 6.667, p <.01; race, X^2 (10, N=622) = 42.88, p <.01; ethnicity, X^2 (8, N=622)=37.18, p <.01; marital status, X^2 (10, N=622)=113.44, p <.01; and poverty status, X^2 (8, N=622)=97.93, p <.01. No significant difference on education between the three health conditions, X^2 (16, N=622) = 17.8, p=.336.

The majority of the sample was male (n=342; 55%), White (n=416; 67%), non-Hispanic (n=292; 47%), and married (n=395; 64%), had a high school diploma (n=302, 49%) and reported a middle to high income (n=373, 60%). Males were predominant in both the PI (n=262, 59%) and CM (n=27, 69%) groups while females were predominant in the on MD group (n=61, 53%). The majority of the individuals reported a PI; these individuals were likely to be White (n=306, 74%) and non Hispanic (n=193, 66%). Noteworthy, all Asians (n=34) in the study self-identified their health conditions as PI; no Asians reported a MD or a CM.

The majority of the individuals with PI (n=344, 73%) and CM (n=13, 33%) reported being married. The majority of the individuals with MD were never married (n=42, 36%). Those who identified themselves as widowed in the study (n=17) were individuals with a PI and 50% of the widowed were Asians.

According to poverty status, individuals with MD and CM reported a lower income while individuals with PI were likely to have a high income. The majority of the individuals with PI either identified themselves as having no degree (n=108, 23%) or a high school diploma (n=219, 47%). Demographic characteristics are presented in Table 4.1.

Table 4-1

Demographic Characteristics

Demographic Characteristics	Mental Disorder (MD) n=114 (18%) n(%)	Physical Illness (PI) n=469 (76%) n (%)	Co-Morbid (CM) n=39 (6%) n (%)
Gender			
Male	53 (15%)	262 (77%)	27 (8%)
Female	61 (22%)	207 (74%)	12 (4%)
Race			
White	80 (19%)	306 (74%)	30 (7%)
Black	25 (16%)	125 (80%)	6 (4%)
American Indian	1 (33%)	2 (67%)	0 (0%)
Asian	0 (0%)	34 (100%)	0 (0%)
Pacific Islander	1 (50%)	1 (50%)	0 (0%)
Multiple Races	7 (64%)	1 (9%)	3 (27%)
Ethnicity			
Black Not Hispanic	23 (15%)	125 (81%)	6 (4%)
Asian Not Hispanic	0 (0%)	33 (100%)	0 (0%)
Not Hispanic	70 (24%)	193 (66%)	29 (10%)
Non-Mexican Hispanic	7 (15%)	36 (76%)	4 (9%)
Mexican-Hispanic	14 (15%)	82 (85%)	0 (0%)

(Table 4-1 Continues)

(Table 4-1 Continued)

Demographic Characteristics	Mental Disorder (MD) n=114 (18%) n(%)	Physical Illness (PI) n=469 (76%) n (%)	Co-Morbid (CM) n=39 (6%) n (%)
Marital Status			
Married	38 (10%)	344 (87%)	13 (3%)
Widowed	0 (0%)	17 (100%)	0 (0%)
Divorced	24 (27%)	54 (60%)	12 (13%)
Separated	10 (53%)	8 (42%)	1 (5%)
Never Married	42 (42%)	45 (45%)	13 (13%)
Education			
No Degree	26 (19%)	108 (77%)	6 (4%)
GED	5 (24%)	12 (57%)	4 (19%)
High School Diploma	61 (20%)	219 (73%)	22 (7%)
Bachelor’s Degree	10 (12%)	72 (84%)	4 (4%)
Master’s Degree	5 (17%)	24 (83%)	0 (0%)
Doctorate Degree	1 (11%)	8 (89%)	0 (0%)
Unspecified	2 (25%)	6 (75%)	0 (0%)
Other Degree	4 (15%)	20 (74%)	3 (11%)
Socio-Economic Status (Poverty Status)			
Poor	47 (44%)	27 (44%)	12 (12%)
Near Poor	8 (21%)	23 (60%)	7 (19%)
Low Income	23 (22%)	74 (70%)	8 (8%)
Middle Income	22 (12%)	161 (86%)	4 (2%)
High Income	14 (8%)	164 (88%)	8 (4%)

Descriptive Statistics for Major Study Variables

The major study variables included population characteristics (predisposing factors {health conditions, demographic factors, poverty status, health attitudes, perceived mental health status} and enabling resources {usual source of care, health care practitioners’ characteristics, personal/family resources and community resources}); health behaviors (health services use and health practice) and health outcomes (physical and mental health status). Each of the major study variables are presented and described according to the Modified Behavioral Model of Health Service Use.

Population Characteristics

Predisposing Factors

Predisposing factors include health conditions, demographic factors, poverty status, health attitudes, and perceived health status. Health conditions, demographic factors and poverty status were discussed previously. Descriptive statistics for health attitudes and perceived health status (perceived health status and perceived mental health status) were obtained and categorized according to participant's self-identified health conditions, [mental disorder (MD), physical illness (PI) and co-morbid mental disorder and physical illness (CM)]. Over 80% of the participants (n=533, 84%) rated their health attitudes. Health attitudes score ranged from 4.00 to 20.00 (M=7.95, *SD*=3.35). The lower scores (4.00) reflect disagreement with the item on the scale while higher scores indicate agreement with the item on the scale. Participants' low scores indicated that health insurance was worth the cost, that they were not likely to take risks and that they could not overcome illness without help. An ANOVA was used to identify health attitudes differences between the health conditions. There were no statistically significant differences in health attitudes between the individuals with MD, PI and CM, F (2, 4.2) =.38, p=.69). Chi square analyses identified significant differences in perceived health status, X^2 (10, N=622) =81.56, p <.01 and perceived mental health status, X^2 (10, N=622) = 208.77, p <.01 between the three health condition groups. The majority of the participants rated their perceived health status (n=519, 83%) and perceived mental health status (n=530, 85%) from "good" to "excellent". Most of the individuals with MD rated their perceived health status (n=46, 40%) and perceived mental health status (n=35, 31%) as “good”. Most of the individuals with PI rated their perceived health status (n=177, 38%) and perceived mental health status (n=159, 34%) as “very good”. Most of the individuals with CM rated their perceived health status as fair (n=13, 33%) while their perceived mental health status was reported as “good” (n=14, 36%). Detailed descriptive statistics for perceived health status) are described in Table 4.2.

Table 4-2

Descriptive Statistics of Perceived Health Status

Perceived Health Status	Health Condition		
Variables	MD (n=114, 18%) n (%)	PI (n=469, 76%) n (%)	CM (n=39, 6%) n (%)
Perceived Health Status			
Excellent	14 (14%)	83 (85%)	1 (1%)
Very Good	23 (11%)	177 (85%)	9 (4%)
Good	46 (22%)	156 (73%)	10 (5%)
Fair	24 (30%)	43 (54%)	13 (16%)
Poor	7 (44%)	3 (19%)	6 (37%)
Inapplicable*	0 (0%)	7 (100%)	0 (0%)
Perceived Mental Health Status			
Excellent	11 (7%)	148 (92%)	1 (1%)
Very Good	20 (11%)	159 (87%)	3 (2%)
Good	35 (19%)	139 (74%)	14 (7%)
Fair	32 (54%)	16 (27%)	11(19%)
Poor	16 (62%)	0 (0%)	10 (38%)
Inapplicable*	0 (0%)	7 (100%)	0 (0%)

*Inapplicable: Question skipped by participants.

Enabling Resources

Descriptive statistics for enabling resources were obtained and categorized according to participant's self-identified health conditions (MD, PI and CM). Enabling resources included usual source of care (provider type), personal and family resources (insurance status), health care practitioners' characteristics (health care practitioners' characteristics gender, race and ethnicity), and community resources (usual source of care location and transportation mode). A Chi square analysis was used to identify differences in usual source of care and insurance status between health condition groups. Eighteen percent of the sample (n=109, 18%) did not identify their usual source of care. Most of the participants (n=281, 45%) indicated their usual source of care was a health care facility (e.g., hospital clinics or outpatient department); and there was no significant difference between groups on usual source of care, X^2 (6, N=513) =7.45, p=.281. Most of the participants reported that they had private insurance (n=392, 63%); and there was a significant difference between groups on insurance, X^2 (4, N=622) =131.57, p<.01. Most of the individuals with MD (n=56, 49%) and CM (n=20, 51%) had public insurance while individuals with PI had private insurance (n=390, 83%).

A Chi square analysis was used to identify differences between groups on the health care practitioner's gender, race and ethnicity. There were no significant differences between groups on health care practitioner's gender, X^2 (14, N=232) = 6.44, p=.169; race, X^2 (8, N=232) = 5.33, p=.721; and ethnicity, X^2 (6, N=232) = 11.31, p=.079. Interestingly, more than 60% of the participants did not report their health care practitioner's characteristics [e.g., gender (n=391, 63%), race (n=399, 64%) or ethnicity (n=395, 64%)]. Of those who did respond, the health care practitioners were most likely to be male (n=189, 81%), White (n=154, 69%) and non-Hispanic (n=199, 88%).

A Chi square analysis was used to identify differences in usual source of care location and transportation mode between individuals with MD, PI, and CM. Eighteen percent (n=109, 18%) did not identify their usual source of care location and transportation mode. Of those who did, most of the individuals indicated the office as their usual source of care location (n=419, 82%) over the hospital clinic or emergency room. The emergency room was the least used for the usual source of care location (n=3, 0.5%). There was no significant difference between groups on usual source of care location, X^2 (6, N=513) =7.44, p=.282. Most of the individuals were self-driven (n=416, 81%) to the usual source of care location. Walking to the usual source of care was the least used transportation mode (n=17, 3%). Individuals with PI were more likely driven to the usual source of care location (n=26, 5%) than riding a public transportation (n=15, 3%) while individuals with CM were more likely ride a public transportation than were driven to the usual source of care location. There was a significant difference between groups on transportation mode, X^2 (8, N=513) =35.95, p <.01. See Table 4.3 for detailed descriptive statistics of enabling resources.

Table 4-3

Descriptive Statistics for Enabling Resources

Enabling Resources	Health Condition		
Variables	MD (n=114, 18%) n (%)	PI (n=469, 76%) n (%)	CM (n=39, 6%) n (%)
Usual Source of Care (Provider Type)			
Facility	59 (21%)	202 (72%)	20 (7%)
Person	22 (14%)	132 (81%)	9 (5%)
Person in Facility	9 (13%)	55 (80%)	5 (7%)
Inapplicable*	24 (22%)	80 (73%)	5 (5%)
Personal/Family Resources			
Insurance Status			
Any Private	37 (9%)	340 (87%)	15 (4%)
Public Only	56 (58%)	41 (35%)	20 (17%)
Uninsured	21 (19%)	88 (78%)	4 (3%)
Health Care Practitioners' Characteristics			
Health Care Practitioner's Gender			
Male	25 (13%)	153 (81%)	11(6%)
Female	6 (14%)	34 (79%)	3 (7%)
Inapplicable*	83 (21%)	282 (72%)	25(7%)
Health Care Practitioner's Race			
White	20 (13%)	123 (80%)	11(7%)
Black	2 (11%)	16(89%)	0 (0%)
Asian	5 (13%)	32 (84%)	1 (3%)
Native American	1 (14%)	6 (86%)	0 (0%)
Other Pacific Islander	2 (33%)	4 (67%)	0 (0%)
Inapplicable*	84 (21%)	288 (72%)	27(7%)
Health Care Practitioner's Ethnicity			
Hispanic	1 (3%)	26 (93%)	1(4%)
Non-Hispanic	28 (14%)	158 (79%)	13(7%)
Inapplicable*	85 (22%)	285 (72%)	25(6%)

(Table 4-3 Continues)

(Table 4-3 Continued)

Enabling Resources Variables	Health Condition MD (n=114, 18%) n (%)	 PI (n=469, 76%) n (%)	 CM (n=39, 6%) n (%)
Community Resources			
Usual Source of Care Location			
Office	72 (17%)	322 (77%)	25(6%)
Hospital Clinics (not ER)	17 (19%)	66 (73%)	8(8%)
Hospital, Emergency Room	1 (33%)	1 (33%)	1(33%)
Inapplicable*	24 (22%)	80 (73%)	5(5%)
Transportation Mode			
Self-driven	56 (13%)	336 (81%)	24(6%)
Is Driven	18 (38%)	26 (54%)	4(8%)
Public Transportation	12 (37%)	15 (47%)	5(16%)
Walk	4 (23%)	12 (71%)	1(6%)
Inapplicable*	24 (22%)	80 (73%)	5(5%)

*Inapplicable: Question skipped by participants

Health Behaviors

Health behaviors comprised health service uses (office-based clinic visits and outpatient-based clinic visits) and health practice (smoking habit). The number of office-based clinic visits (Mean= 4.1, *SD*=8.95, range 0-132) was significantly greater than the number of outpatient hospital-based visits (Mean=0.29, *SD*=1.55, range 0-26). Office-based clinics were much preferred over outpatient hospital-based clinics. A one-way ANOVA indicated there was a significant difference in the office-based clinic visits between groups, *F* (2, 2) =87.53, *p*=.000. Individuals with a CM reported the greatest number of office-based clinic visits (Mean=14.94, *SD*=13.67) compared to individuals with a MD (Mean=9.98, *SD*=16.24). Individuals with a PI reported the lowest number of office based clinic visits (Mean=1.82, *SD*=1.99).

There were statistically significant differences in outpatient hospital-based clinic visits, *F* (2, 2) =9.63, *p* =.000 between the three health condition groups. Individuals with a MD had the highest number of outpatient hospital-based clinic visits (Mean=.789, *SD*=3.22) compared to individuals with a CM (Mean=.14, *SD*=.63). Individuals with a PI reported the lowest number of outpatient hospital-based clinic visits (Mean=.14, *SD*=.63). See Table 4.4 for descriptive statistics of health services use.

Table 4-4

Descriptive Statistics of Health Services Use

Health Services Use				95% CI	
Variables		M	*SD*	LB	UB
Total Office-Based Clinic Visits					
Mental Disorder	(MD)	9.9	16.2	6.9	12.9
Physical Illness	(PI)	1.8	1.9	1.6	2.0
Co-morbid	(CM)	14.9	13.6	19.5	19.3
Total Outpatient Hospital-Based Visits					
Mental Disorder	(MD)	0.78	3.2	0.19	1.3
Physical Illness	(PI)	0.14	0.6	0.08	0.2
Co-morbid	(CM)	0.71	1.6	0.19	1.2

A Chi square analysis indicated that there were statistically significant differences between groups on smoking, X^2 (6, N=622) = 60.04, *p*<.01. Most of the participants were non-smokers (n=392, 63%). Interestingly, majority of the participants with a PI indicated they were non-smokers (n=325, 83%) while majority of the participants with a MD (n=51, 50.5%) and a CM (n=18, 51%) indicated they were smokers. There were 90

(14%) participants who did not indicate their smoking habit. See Table 4.5 for descriptive statistics of health practice (smoking).

Table 4-5

Descriptive Statistics of Health Practice (Smoking)

Smoking Variable	Health Condition		
	MD (n=114) n (%)	PI (n=469) n (%)	CM (n=39) n (%)
Currently Smoke			
Yes	51 (36%)	71 (51%)	18 (13%)
No	50 (13%)	325 (83%)	17 (4%)
Inapplicable*	13 (15%)	73 (81%)	4 (4%)

*Inapplicable: Question skipped by participants

Health Outcomes

Descriptive statistics for health outcomes (physical health status and mental health status) were obtained and categorized according to participant's self-identified health conditions, (MD, PI, CM). A one-way ANOVA determined that there were no significant differences in physical health status, *F* (2, 619) = .713, *p*=.490 between health condition groups. There were significant differences in mental health status, *F* (2, 619) =21.68, *p*=.000 between groups. The mental health status of individuals with PI was significantly better than that of participants with MD. Participants with CM had a poorer mental health status than those with PI and MD.

Not surprisingly, individuals with MD reported a better physical health status (Mean=43.4; *SD*=18) than mental health status (Mean=33.7; *SD*=18.3). Similarly, individuals with CM indicated that their physical health status (Mean=39.7; *SD*=20) was better than their mental health status (Mean=31.5; *SD*, 17.8). Although individuals with MD and those with CM indicated their physical health status was better than their mental health status, these results were not significant (*p*=.490). As might be expected, mental health status of individuals with PI (Mean=45.5; *SD*=20.8) was significantly higher than their physical health status (Mean=43.6; *SD*=20.1). See Table 4.6 for the descriptive statistics of health outcomes.

Table 4-6

Descriptive Statistics of Health Outcomes

Health Outcomes			95% CI			
Variables	M	*SD*	LB	UB	F	p
Physical Health Status					.713	.490
Mental Disorder	43.4	18	40.1	46.8		
Physical Illness	43.6	20	41.8	45.4		
Co-morbid	39.7	20	33.2	46.2		
Mental Health Status					21.685	.000*
Mental Disorder	33.7	18.3	30.3	37.1		
Physical Illness	45.5	20.8	43.6	47.4		
Co-morbid	31.5	17.8	25.7	37.3		

*p<.05

Results

Aim 1 Research Question 1 (A1R1)

A one-way multivariate analysis of variance (MANOVA) was conducted to determine the effect of predisposing factors (health conditions (mental disorders, physical illness , co-morbid mental disorders and physical illness)}, demographic factors {age, gender, race, ethnicity, education, marital status}, socio-economic status {poverty status}, health attitudes and perceived health status {perceived health status, perceived mental health status}) and enabling resources (usual source of care {provider type}, health care practitioner's characteristics {health care practitioners' gender, race and ethnicity}, personal/family resources {insurance status}, and community resources {usual source of care location and transportation mode})] on health behaviors (health services use {office-based clinic visits and outpatient hospital-based clinic visits} and health practice {smoking habit}). MANOVA results indicated that health conditions, Wilks' Λ= .50, $F(6, 54)=3.7$, $p=.003$, partial $\eta^2=.212$; ethnicity, Wilks' Λ= .50, $F(9, 65)=2.45$, $p=.018$, partial $\eta^2=.107$, health attitudes, Wilks' Λ= .126, $F(42, 81)=2.0$, $p=.005$, partial $\eta^2=.238$, perceived mental health status, Wilks' Λ= .213, $F(12, 72)=4.7$, $p=.000$, partial $\eta^2=.129$, and usual source of care location, Wilks' Λ= .738, $F(3, 27)=3.2$, $p=.04$, partial $\eta^2=.024$ had a significantly effect on the combined dependent variables of office-based clinic visits, outpatient hospital-based clinic visits, smoking habit. However, multivariate effect sizes are small.

Univariate ANOVA and Bonferroni post hoc tests were conducted as follow-up tests. ANOVA results indicated that the DV office-based clinic visits significantly differs for health conditions, $F(2, 703)=5.94$, $p=.007$, partial $\eta^2=.064$, and perceived mental health status $F(4,769.48)=6.50$, $p=.001$, partial $\eta^2=.079$. ANOVA results also indicated that the DV outpatient hospital-based clinic visits significantly differs for ethnicity, $F(3, 3.805)=5.125$, $p=.006$, partial $\eta^2=.205$; and health attitudes $F(14, 1.63)=2.192$, $p=.036$, partial $\eta^2=.402$. The DV smoking significantly differs for health attitudes only, $F(14, 1.794)=2.2$, $p=.034$, partial $\eta^2=.182$.

Bonferroni post hoc results for health services indicated that individuals with mental disorders (MD) and co-morbid mental disorders and physical illness (CM) preferred office-based clinics more than individuals with physical illness (PI). Individuals with fair to excellent perceived mental health status were more likely to be non-smokers than individuals with poor perceived mental health status. Individuals with poor perceived mental health status preferred to visit office-based clinics than those with fair to excellent perceived mental health status. Individuals who were self-driven to their usual source of care were more likely to be non-smokers than individuals who walk and use public transportation (i.e. taxis, bus and train). Non-Mexican Hispanics were more likely to visit the outpatient hospital-based clinics than Black non-Hispanics and non-Hispanics. Other relationships were non- significant. A1R1 was partially supported.

Aim 1 Research Question 2 (A1R2)

A one-way MANCOVA was conducted to determine the relationship of population characteristics [(predisposing factors {health conditions (mental disorders, physical illness, co-morbid mental disorders and physical illness)}, demographic factors {age, gender, race, ethnicity, education, marital status}, socio-economic status {poverty status}, health attitudes, and perceived health status {perceived health status, perceived mental health status})], and health behaviors (health services use {office-based clinics visits, outpatient hospital-based clinics visits}and health practice {smoking habit}) controlling for selected moderating factors, enabling resources (usual source of care {provider type}, health care practitioner's characteristics {health care practitioners' gender, race and ethnicity and provider type}, personal/family resources {insurance status} and community resources{usual source of care location and transportation mode}). The main effects of marital status, Wilks' Λ= .95, $F(3, 138)=2.7$, p=.049, and perceived mental health status, Wilks' Λ= .93, $F(3, 138)$ =3.5, p=.018, had a significant effect on the combined DV of health behaviors. The covariates [health care practitioner's gender and usual source of care, Wilks' Λ= .92, F(3, 138)=4.031, p=.009; health care practitioner's gender and usual source of location, Wilks' Λ= .88, F(3, 138) =6.031, p=.001; usual source of care and transportation mode, Wilks' Λ= .81, F(9, 336) =3.357, p=.001; and health care practitioner's gender, usual source of care and transportation mode, Wilks' Λ= .88, F(3, 138)=6.448, p=.000] significantly influenced the combined DV of health behaviors.

Univariate ANOVA results indicated that only the dependent variable of smoking was significantly effected by the covariate health care practitioner's gender and usual source of care, F (1, 10) =13.38, p=.002; health care practitioner's gender and usual source of care location, F (2, 29) =5.125, p=.006; usual source of care and transportation mode, F (2, 29) =2.22, p=.034; and health care practitioner's gender and usual source of care, F (2, 29) =6.496, p=.000. After controlling for enabling resources only perceived mental health status remained to have significant relationships with health behaviors. Individuals with poor perceived mental health status preferred to visit office-based clinics than those with fair to excellent perceived mental health status. Other effects were non-significant. A1R2 was partially supported.

Aim 1 Research Question 3 (A1R3)

General linear model or a one-way multivariate analysis of variance (MANOVA) was conducted to determine the relationship of population characteristics [(predisposing factors{health conditions (mental disorders, physical illness, co-morbid mental disorders and physical illness)}, demographic factors {age, gender, race, ethnicity, education, marital status}, socio-economic status {poverty status}, health attitudes, and perceived health status {perceived health status, perceived mental health status}, and enabling resources (usual source of care {provider type}, health care practitioner's characteristics health care practitioners' gender, race and ethnicity}, personal/family resources {insurance status},and community resources {usual source of care location, transportation mode})], health behaviors (health services use {office-based clinic visits, outpatient hospital-based clinic visits}, health practice {smoking habit}), and health outcomes (physical health status {physical component summary} and mental health status {mental component summary}). MANOVA results indicated that health conditions, Wilks' Λ= .88, *F* (4, 186) =3.1, *p*=.017, perceived mental health status, Wilks' Λ= .81, *F* (8, 186) =2.4.7, *p* =.016, and usual source of care location, Wilks' Λ= .81, *F* (2, 93) =10.58, *p* =.000, significantly influenced the combined dependent variables of health outcomes (physical health status and mental health status).

Univariate ANOVA and Bonferroni post hoc tests were conducted as follow-up tests. ANOVA results indicated that the DV mental health status significantly differed for health conditions (mental disorders, physical illness, co-morbid mental disorders and physical illness), *F*(2, 494) =5.5, *p*=.005; perceived mental health status, *F*(4, 300) =3.3, *p* =.013; and usual source of care location, *F*(1, 1388) =15.51, *p*=.000. The DV physical health status differed significantly for usual source of care location, *F*(1,1362)=14.47, *p* =.000.

Bonferroni post hoc results for health outcomes indicated that individuals who have mental disorders and those with a co-morbid mental disorder and physical illness were more likely to have lower mental health status scores than those with a physical illness condition only. Those whose perceived mental health status was not reported have significantly lower mental health status scores than individuals who indicated their perceived mental health status. Those whose usual source of care location was not reported were more likely to have lower physical health status scores than those who indicated office as their usual source of care location. Those whose usual source of care location was not reported have significantly lower mental health status scores than those who indicated the office and hospital clinics as their usual source of care location. Other relationships were non- significant. A1R3 was partially supported.

Aim 1 Research Question 4 (A1R4)

A one-way MANCOVA was conducted to determine the relationship of population characteristics [(predisposing factors (health conditions {mental disorders, physical illness, co-morbid mental disorders and physical illness}, demographic factors {age, gender, race, ethnicity, education, marital status}, socio-economic status {poverty status}, health attitudes, and perceived health status {perceived health status, perceived mental health status})], health behaviors (health services use {office-based clinic visits, outpatient hospital-based clinic visits}and health practice {smoking habit}), and health outcomes (physical health status {physical component summary}and mental health status {mental component summary}) controlling for selected moderating factors [enabling resources (usual source of care {provider type}, health care practitioner's characteristics{health care practitioners' gender, race and ethnicity}, personal/family resources {insurance status} and community resources {usual source of care location and transportation mode})]. The main effects of health conditions, Wilks' Λ= .94, *F*(2, 136) =4.7, *p*=.011, race, Wilks' Λ= .93, *F*(2, 136) =5.0, *p*=.008, perceived health status, Wilks' Λ= .83, *F*(2, 136) =13.5, *p*=.000, perceived mental health status, Wilks' Λ= .85, *F*(2,136)

=12.3, *p*=.000, and total office-based clinic visits, Wilks' Λ= .89, *F*(2,136) =7.7, *p*=.001 had a significant effect on the combined DV of health outcomes (physical health status and mental health status).

The covariates significantly influenced the combined DV of health outcomes, usual source of care location, Wilks' Λ= .92, *F*(2, 136) =5.7, *p* =.004; health care practitioner's gender and health care practitioner's ethnicity, Wilks' Λ= .905, *F*(6, 272) =2.32, *p*=.034; health care practitioner's gender and usual source of care location, Wilks' Λ= .95, *F*(2, 136) =3.36, *p*=.36; and health care practitioner's ethnicity and usual source of care location, Wilks' Λ= .91, *F*(4, 272) =3.33, *p*=.011. The ANOVA results indicated that the dependent variable physical health status was significantly effected by health conditions, *F*(1, 393) =6.53, *p*=.012, race, *F*(1, 605) =10, *p*=.002; perceived health status, *F*(1, 1,546) =25.6, *p*=.000; perceived mental health status, *F*(1, 521) =8.65, *p*=.004; office-based clinic visits, *F*(1, 877) =14.54, *p*=.000; the covariates usual source of care location, *F*(1, 560) =9.3, *p*=.003; health care practitioner's ethnicity, *F*(4, 172) =2.86, *p*=.026; and the combined covariates health care practitioner's gender and health care practitioner's ethnicity, *F*(3, 227) =3.76, *p*=.012; health care practitioner's ethnicity and usual source of care location, *F*(2, 391) =6.5, *p*=.002; and health care practitioner's gender, health care practitioner's ethnicity and usual source of care location, *F*(1, 263) =4.378, *p*=.038. The ANOVA results also indicated that the dependent variable mental health status was significantly effected by health conditions, *F*(1, 535) =5.67, *p*=.019, perceived mental health status, *F*(1, 824) =8.74, *p*=.004; office-based clinic visits, *F*(1, 469)=4.98, *p*=.027; the covariates usual source of care location, *F*(1, 504) =5.3, *p*=.022;

and the combined covariates health care practitioner's gender and usual source of care location, *F*(1, 582)=6.17, *p*=.014.

After controlling for enabling resources only perceived mental health status remained to have significant relationship with health outcomes. Those whose perceived mental health status was not reported had significantly lower mental health status scores than individuals who indicated their perceived mental health status. Other effects were non-significant. A1R4 was partially supported.

Aim 2 Research Question 1 (A2R1)

A Kruskal-Wallis test was conducted to evaluate the differences in usual source of care between individuals with self-reported mental disorders and individuals without mental disorders. The test, which was corrected for tied ranks, was non-significant, χ^2 (2, N= 622) =5.34, *p*=.069. The results of the tests indicated a non-significant difference between the usual source of care and health conditions groups. The majority of participants used a facility either the hospital clinic or the outpatient department as their usual source of care (n=213, 54%). Individuals with MD preferred the hospital clinic or outpatient department as their usual source of care (n=59, 66%) more than individuals with PI (n=202, 52%) or CM (n=20, 58%). Individuals with PI preferred the provider who works in the office as their usual source of care (n=132, 34%) more than the individuals with MD (n=22, 24%) or CM (n=9, 33%). These differences were not significant. A2R1 was not supported.

Aim 2 Research Question 2 (A2R2)

A one-way analysis of variance was conducted to evaluate the difference in physical health status between individuals with self-reported mental disorders and individuals without mental disorders. The independent variable was health conditions (mental disorders, physical illness, co-morbid mental disorders and physical illness); the dependent variable was the physical health status. The ANOVA was non-significant, *F*(2, 619) =.713, *p*=.490. There was no significant difference in the physical health status means between the three health conditions groups. However, the mean of co-morbid group was lower (M=39, SD=20) than the means for both MD group (M=43, SD=18) and PI group (M=43, SD=20). This result indicated that individuals with self-reported mental disorders did not differ in physical health status when compared to individuals without mental disorder. A2R2 was not supported.

Aim 2 Research Question 3 (A2R3)

A one-way analysis of variance was conducted to evaluate the difference in mental health status between individuals with self-reported mental disorders and individuals without mental disorders. The independent variable was health conditions (mental disorders, physical illness, co-morbid mental disorders and physical illness); the dependent variable was the mental health status. The ANOVA was significant, *F*(2, 619) =21.68, *p*=.000. The strength of relationship between health conditions and physical health status, as assessed by η2 was weak, with the health conditions accounting for 6% of the variance of the dependent variable.

Follow-up tests were conducted to evaluate pairwise differences among the mental health status mean scores. Bonferroni post hoc comparisons indicated that there were significant differences between in the mental health status mean scores between groups. Individuals with PI (45.5, *SD*=20.82) had a higher mental health status score than the individuals with MD (37.8, *SD*=18.3) and CM (31.52, *SD*=17.83). The 95%

confidence intervals for the pairwise differences, as well as the means and standard deviations for the three health conditions are reported in Table 4.7. There was a significant difference in mental health status between individuals with self-reported MD (mental disorders only and co-morbid) and individuals without mental disorders (PI only). Individuals with PI rated their mental health status better than individuals with self-reported MD and individuals with CM. A2R3 was supported.

Table 4-7

95% Confidence Intervals of Pairwise Differences in Mean Mental Health Status

Mental Health Status	M	*SD*	Mental Disorders	Physical Illness
Mental Disorder	33.7	18.3		
Physical Illness	45.5	20.8	6.7 to 16.84	
Co-morbid	31.5	17.8	-11.26 to 6.74	-22.12 to -6.0

Summary

Multivariate analysis of variance (MANOVA) was used to analyze A1R1 and A1R3 while multivariate analysis of covariance (MANCOVA) was used to analyze A1R2 and A1R4. A univariate analysis of variance (ANOVA) was used to analyze A1R1, A2R2 and A2R3. The sample (N=622) was categorized according to three health conditions, mental disorder (n=114), physical illness (n=469) and co-morbid mental disorder and physical illness (n=39). The sample was primarily male, White non-Hispanic, married, had high school diploma, middle to high income, had private insurance; and was a non-smoker. Furthermore, the majority of the participants indicated their perceived health status and perceived mental health to be “good” to “excellent”. Most of the participants indicated facilities such as hospital clinics and outpatient departments for their usual source of care (provider type). Most of the participants reported positive health attitudes.

The majority of the participants who indicated their health care practitioners were male, and non-Hispanic White. Most of the participants identified the office-based clinics as their usual source of care location and self-driven as their transportation mode. There were more office-based clinic visits than the outpatient hospital-based clinic visits for health care services. Individuals with physical illness reported that their mental health status was better than their physical health status.

Aims A1R1, A1R2, A1R3 to A1R4 were partially supported as some significant relationships existed among the study variables. Perceived mental health status remained significant on health behaviors and health outcomes after controlling for enabling resources. Individuals with poor perceived mental health status preferred office-based clinics than those with fair to excellent perceived mental health status. Those whose perceived mental health status was not reported had significantly lower mental health status scores than individuals who indicated their perceived mental health status. Although some significant relationships were found between the variables analyzed in A2R1 to A2R2, the main premises of the research questions were not supported as there were no significant differences in usual source of care and physical health status between individuals with self-reported mental disorders and individuals without mental disorders. Aim A2R3 was supported. A significant difference was found in mental health status between individuals with self-reported mental disorders and individuals without mental disorders. Individuals with CM were more likely to have a poorer mental health status than individuals with PI or MD.

CHAPTER V

Discussion and Conclusion

This chapter contains a discussion of findings of this study and comments on the usefulness of the Modified Behavioral Model of Health Services Use model guiding the study. Limitations of the study are presented. Nursing implications and recommendations for future research are discussed.

Discussions of Findings

Modified Behavioral Model of Health Services Use (BMHSU)

This study utilized Modified Behavioral Model of Health Service Use (BMHSU) to explore and understand the relationships of predisposing factors, enabling resources, health behaviors and health outcomes as well as differences in usual source of care and health outcomes between individuals with self-reported mental disorders and those without mental disorders. In this study, the BMHSU framework described the complexity of determining health outcomes and gave directions to the study analyses (MANOVA, MANCOVA, and ANOVA). The application of BMHSU was useful in examining the relationships of population characteristics, health behaviors and health outcomes of individuals with self- reported mental disorders and individuals without mental disorders.

Sample

The sample of this study was predominantly male, White, married, with a high school diploma, and middle to high income status. This sample is representative of the total U.S. population for race, marital status and poverty status but not for gender and education. According to the U.S. Census Bureau (2010), the current U.S. population is predominantly females (50.4%), White (74%), married (50.3%), with some college education (41%), and a middle to high income (51%). Education level is somewhat higher in the national U.S. population than the sample in this study. Similarly, Zeber, et al.'s (2009) sample of Veterans with mood disorders (N=435) was predominantly White (n=336, 77.3%) male (n=373, 85.7%); however they differed on regards to marital, education and income status. In the Veteran's sample, a lower percentage of participants reported being married (n=131, 30.2%) than this study. In addition, Zeber's sample reported some college education (n=299, 68%) and low income status (n=154, 59.9%) in contrast with the results of this study. This profile is in sharp contrast to most studies on health outcomes among individuals with mental health conditions wherein the sample was predominantly female, non Hispanic, White, and 35 to 54 years old, with a low to middle income status (Bandeira et al., 2008; Keyes et al., 2008). The difference in sample characteristics can be partly explained by the fact that this study included persons that did not report a mental disorder.

The findings in this study contradict the findings of Kass et al. (2007) on attitudes related to health insurance and the health care system. Individuals with chronic medical conditions were more likely to have health insurance (95%); however, they reported being denied coverage by insurance companies because of their current medical condition

(Kass et al., 2007). On the other hand, Machlin and Carper (2005) reported no significant differences in the health attitudes for those individuals with private and public insurance. Also the uninsured population between the ages of 18 and 64 years perceived that they were healthy, did not need health insurance and insurance was not worth the cost (Machlin & Carper, 2005).

In Al-Windi's study (2005), most respondents with health conditions (e.g., hypertension, psychiatric disorders, musculoskeletal disease) reported poor perceived health status. Perceived health status was influenced by demographic characteristics (i.e. age, gender, employment). Female participants, 45-64 years old, and unemployed were more likely have poor perceived health status. Life satisfaction with health was the strongest predictor of poor perceived health status (Al-Windi, 2005). Although participants in this study were more likely have perceived health status higher than Al-Windi participants, further research is needed to clarify the direction of association between demographic characteristics and perceived health status. The differences in the relationship of age, gender, and health conditions reflect variations in the sample characteristics of these studies suggesting that a more detailed examination of sample characteristics including geographical location would be beneficial to better describe the sub-samples and determine their needs.

Enabling Resources

Carper and Machlin (2009) reported that individuals without usual source of care and insurance were more likely to have issues accessing medical care. Additionally, Xu (2002) implied that individuals with usual source of care were more likely to have a regular physician, use preventive services and access health services than those without usual source of care. In this study, facility (e.g., hospital clinics and outpatient department) was the preferred usual source of care. However, other facilities (i.e., urgent care centers, retail clinics) were used as usual source of care in other studies (Weinick et al., 2010). Determining the preferred usual source of care for patients with MD in various locations would give directions to strategies for assuring health care access.

Findings of this study indicated there were no significant differences in health care practitioner's characteristics (gender, race, ethnicity) among individuals with MD, PI and CM. Additionally, there was no significant relationship of health care practitioner's characteristics to health outcomes on individuals with health conditions. Similarly, Kearns and Ji (2007) reported that there were no significant relationships of patient-provider gender/racial/ethnic concordance, health services use and health outcomes among Florida Medicaid recipients. Additionally, Johnson et al. (2004) stated that racial ethnic differences did not fully explain the differences in demographic factors, health status, usual source of care, patient-provider concordance between racial-ethnic groups; and other factors must be considered that include cultural competence and language related bias perceptions.

Rubin, Peyrot, and Siminerio (2006) found the quality of patient-provider collaboration was the strongest predictor of patient outcomes among individuals with diabetes. In this study, access to providers was significantly associated with positive patient outcomes. Strategies of effective patient-provider collaboration must be given priority to address the physical and the psychosocial needs of individuals with physical illness, mental disorders and co-morbidity and would enhance patient outcomes.

Studies that focus on the relationships of provider-patient concordance and patient outcomes or the influence of health care practitioner's characteristics to patient outcomes need further investigation. Interpretations of relationships and effects of variables to patient outcomes are highly inconclusive but the results can be used to either support or refute hypotheses in future studies that focus on provider's characteristics (gender, race and ethnicity). Future research must also include cultural competence among health care providers to address the existing racial ethnic disparities among diverse populations with health care needs (Park & Grindel, 2007; Perilla, Norris, & Lavizzo, 2002).

Health Behaviors

Similar findings of this study on health services use and health practice (smoking) were noted from previous studies. The study of Ahmed and Fincham (2010) had similar findings with this study on health services use. The office-based clinic visits was the most preferred for health services.

In this study, 63% of the sample was non-smoker. Carper and Machlin (2005) reported that out of the 43.6 million U.S. civilian noninstitutionalized population in 2003, 78.3% have indicated themselves as non-smokers (Carper & Machlin, 2005). In this study, the non-smokers were predominantly among individuals with physical illness, similar to the findings of Coultas et al. (2007).

Health Outcomes

Sareen et al. (2006) reported that co-morbid mental disorder and physical illness (CM) was associated significantly with poor health outcomes. Similarly, the findings of this study indicated that individuals with CM had the poorest health outcomes (physical health status and mental health status) compared to their counterparts (individuals with

MD and PI). Additionally, the findings of Sorkin, Tan, Hays, Mangione, and Ngo-Metzger (2008) reported that individuals with mental disorders significantly have poorer mental health status than those with physical illness. Individuals with physical illness reported poorer physical health status than the individuals with mental disorders and no significant differences in physical health status between health conditions. These results were similar with the findings of this study.

Findings from this study indicated that there was a significant relationship between smoking and perceived mental health status. Individuals with fair to excellent perceived mental health status were more likely to be non-smokers than individuals with poor perceived mental health status. McLeish, Zvolensky, Smits, Bonn-Miller, and Gregor (2007) found poorer perceived mental health status but no significant relationship between smoking and perceived mental health status. The sample consisted of females, young, college education, and daily smoker (McLeish et al., 2007). Differences in gender, age, education and smoking habit may have contributed to contradictions in these two studies.

Findings in this study suggested that individuals with poor perceived mental health status preferred to visit office-based clinics than those with fair to excellent perceived mental health status. Hwang and Henderson (2010) found that majority of the homeless individuals who have poor perceived mental health status used the emergency department as their usual source of care contrary to the findings of this study. The differences in the results of these two studies were more likely due to the variations in the sample characteristics (e.g., insurance status, poverty status, health conditions).

Similar to findings by Devoe, Wallace and Fryer (2009) and Stagnitti (2009), our study found that non-Mexican Hispanics were more likely to visit the outpatient hospital-based clinic than Black non-Hispanics and non-Hispanics. Stagnitti (2009) reported a recent pattern that showed an increasing use of outpatient hospital-based clinic by Black non-Hispanics in order to acquire prescription analgesics. One suggestion regarding the use of outpatient hospital-based clinics was to be attentive to individual patient characteristics and health care needs in order to provide better patient outcomes in a given health care setting.

Significant differences were found between usual source of care location and health outcomes (physical health status and mental health status). Provider's offices were the preferred location for usual source of care. The individuals who preferred the provider's offices were more likely to have better health outcomes. Similarly, Hwang and Henderson (2010) reported that homeless adults used office-based clinics more frequently than the emergency rooms for medical treatment and were more likely to report satisfaction with care. Harrison et al. (2008) asserted that the key factor to improved health outcomes is contingent upon the delivery of evidence-based practice provided by qualified health care practitioners and not the location of usual source of care.

Findings from this study indicated that after controlling for enabling resources (health services, smoking), a significant relationship between perceived mental health status and health behaviors remained. Individuals with poor perceived mental health status preferred office-based clinics. Similarly, Ralph-Campbell, Pohar, Guirguis, and Toth (2006) reported individuals with poor perceived mental health status sought treatment in a physician's office or an emergency room. Poor access to mental health clinics and lack of culturally sensitive treatment programs were reasons for the disparities in location of health services and treatment.

Additionally, after controlling for enabling resources (health services, smoking), a significant relationship between perceived mental health status and health outcomes remained. Individuals who did not report their perceived mental health status had significantly lower mental health status scores than individuals who indicated their perceived mental health status. Findings from this study suggested that individuals who rated their perceived mental health status good to excellent were more likely to have better mental health status than those who rated their perceived mental health status poor. Several studies support the relationship of perceived mental health status and mental health status (Cole, 2007; Overland, Glozier, Maeland, Aaro, & Arnstein, 2006). Weinick et al. (2006) reported that individuals who rated their perceived mental health status as poor had difficulty accessing usual source of care resulting in poor mental health status. Rhoades (2004) also reported that individuals with poor perceived mental health status deteriorated their physical and mental health status eventually due to issues on accessing usual source of care.

The provider's office was the preferred usual source of care for individuals with self-reported mental disorders and those individuals without mental disorders. Similarly, Garibaldi, Conde-Martel, and O'Toole (2005) found no differences in usual source of care in individuals with mental disorders or physical illness. The samples in this study and the Garibaldi et al. (2005) study were similar as both samples reported a moderate to high income and had health care insurance. Most studies that reported significant differences in the usual source of care were conducted with persons who had limited or no health insurance coverage and/or a low income (O'Toole, Gibbon, Hanusa, Fine, 1999; Richardson & Norris, 2010; Waidman & Rajan, 2000).

In this study, findings on physical health status are inconsistent with other studies in that there is an association of chronic health conditions with poor physical health status (Brown, Ang, & Pebley, 2007). No significant differences were reported on physical health status between individuals with self-reported mental disorders and those without mental disorders. Philipps, Hammock, and Blanton (2005) reported that a college education, non-Hispanic ethnicity, health insurance and a higher income were associated with good to excellent rating on physical health status. Although the participants in this study were not as likely to have a college education, they were likely to have a high school diploma, with health insurance and a middle to high income. In addition, the sample in this study was primarily White, non-Hispanic.

Consistent with other studies, individuals with health conditions were significantly different in mental health status and perceived mental health status. Individuals with MD and/or CM who perceived their mental health status as poor also reported worsening mental health status (Straus et al., 2009). Individuals with a physical illness perceived their mental health status as good to excellent and they also reported better mental health status than individuals with mental disorders. Individuals with physical conditions would be expected to rate their perceived mental health and mental health outcome higher than their physical health because of their existing physical needs (Mozumdar & Roy, 2010).

Limitations of the Study

Generalization of the findings of this study is limited because the sample was predominantly White with a moderate to high income; these results may not be applicable to other racial-ethnic groups or marginalized individuals. Additionally, these results cannot be generalized to individuals younger than 18 years old or older than 66, individuals who are institutionalized, or individuals with illnesses or diseases that were excluded from the study (e.g., terminal illnesses, personality disorders, and dementia). Relying on self-reported data inherent in surveys such as MEPS can be problematic because of the possibility of reporting errors or inaccuracies in the data that could compromise the results. In addition, cross-sectional designs such as used in this study describe a single time period; longitudinal studies that follow participants overtime would provide a better understanding of health care practices and health outcomes. Causal relationships are difficult to establish with cross-sectional designs; however, the complexity of the issues of health care access, health behaviors and health outcomes can best be studied with exploratory correlational designs.

Nursing Implications

The potential implications of this study are relevant to nursing education, clinical practice, and research. Nurse educators can use the BMHSU model to explain the numerous factors that affect health practice and outcomes so students are aware of the barriers that can impact potential outcomes. Awareness of the complexity of the relationship of these factors will support nursing interventions that eliminate barriers to care and promote better health practices and outcomes. In doing so disparities related to health care can be eliminated and morbidities and mortalities among individuals with mental disorders (MD) will be reduced.

Knowledge about the strategies to reduce health care barriers and health services use disparities among individuals with MD, PI, and CM is not enough. Follow through actions relevant to the care of these population are needed. The development and testing of innovative nursing interventions that are designed to remove barriers to health care services will reduce disparities in care and facilitate better health practices and outcomes. Such interventions would benefit persons with mental illness as they are often marginalized in the current health system. Finally, nurses must take an active role in the development and implementation of healthcare policies that facilitate access to healthcare and assure health care disparities are not inflicted on marginalized individuals.

Recommendations for Future Research

Community based descriptive research that examines the factors affecting health practices and outcomes of persons with mental disorders would give highlights to the unique care needs and barriers within the community and provide direction to the implementation of interventions that would assure quality health care services to personal with mental disorders thus improving patient outcomes. Prospective longitudinal research studies can refine our understanding about the relationship between environment, population characteristics, health behaviors and health outcomes. Further exploration of factors associated with health care services use, health behaviors, and health outcomes is suggested to set the stage for intervention studies that will assure access to care and improved health outcomes.

Summary

The results of this study add insights into the perceived health status, usual source of care, health behaviors and health outcomes of persons with mental disorders. The application of BMHSU was useful in examining the relationships of population characteristics, health behaviors and health outcomes as well as the differences in usual source of care, physical health status and mental health status between individuals with self- reported mental disorders and those without mental disorders. The sample in this study consisted predominantly of White, male, non-Hispanic, high school graduates, and middle to high income status. The results provided support for the impact of perceived mental health status on health behaviors and health outcomes. The findings that there were no statistically significant differences in the usual source of care and physical health status between individuals with mental disorders and those without mental disorders suggest the need for further exploration to either support or refute these findings. The results provided support for the significant differences in mental health status between individuals with mental disorders and those without mental disorders. Individuals with PI were more likely have higher perceived mental health status and better mental health status than those individuals with mental disorders.

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APPENDIX A

Detailed Description of Variables Categorized according to the Concepts of the Modified Version of BMHSU

MEPS HC-105 2006

Appendix A: Detailed Description of Variables Categorized according to the Concepts of the Modified Version of BMHSU

MEPS HC-105 2006

Population Characteristics

Health Conditions are categorized into three groups namely mental disorders (MD, physical illness (PI), and co-morbid mental disorder and physical illness (CM).

Demographic Factors include age, gender, marital status, race, ethnicity, and education.

- Age (AGE42X) was calculated based on their date of birth by December 31, 2006. The AGE 42X was entered as continuous variable but categorized into three: 18-24, 25-44 and 45-65 years.
- Gender variable (SEX) is categorized as male or female.
- Marital status (MARRY42) is categorized as married, widowed, divorced, separated, never married, and under 16 years old/inapplicable.
- Race (RACEX) is categorized into White and no other race reported; Black and no other race reported; American Indian or Alaska Native and no other race reported; Asian and no other race reported; Native Hawaiian or Pacific Islander and no other race reported; and multiple races reported.
- Ethnicity (HISPNX) is categorized as Hispanic and not Hispanic.
- Education (HIDEG) is defined as the highest degree when entered in MEPS. HIDEG is categorized as no degree, GED, high school diploma, Bachelor's degree, Master's Degree, Doctorate Degree, other degree and under 16 years old/inapplicable.

Socio-economic status included poverty status.

- Poverty status (POVCAT06) is defined as family income as percent of poverty line and categorized as poor, near poor, low income, middle income and high income.

Health Attitudes include opinions on health insurance and deciding factor in purchasing health insurance and use of health services. Responses had 5 choices such as disagree strongly, disagree somewhat, uncertain, agree somewhat and agree strongly. The four variables (ADINSA42, ADINSB42, ADRISK42 and ADOVER42) were merged, recoded and renamed health attitudes (HEALTHATTITUDES). ADINSA42 is defined as healthy enough and do not need health insurance. ADINSB42 is defined as health insurance not worth the money it costs. ADRISK42 is defined as more likely to take risks than the average person. ADOVER42 is defined as can overcome illness without medical help.

Perceived health status consisted of perceived health status and perceived mental health status.

- Perceived health status (RTHLTH42) is the participant's rating on general health status with five response choices (excellent, very good, good, fair and poor).
- Perceived mental health status (MNHLTH42) is the participant's rating on mental health status with five response choices (excellent, very good, good, fair and poor).

Enabling Resources

Enabling Resources include usual source of care, personal/family resources, health care practitioners' characteristics, and community resources.

- ***Usual Source of Care*** (PROVTY42) is defined as the type of provider whether facility, person or person in the facility.
    - Facility is defined as either hospital clinic or outpatient department.
    - Person is defined as the provider works in the office individually and not associated with any group practice.
    - Person in the facility is defined as any of the following: Provider is General/Family Practice, Internal Medicine, Pediatrics, OB/Gyn, Surgery, Chiropractor, Nurse, Nurse Practitioner, Physician's Assistant, Other Non-MD Provider and Unknown, Cardiologist, Doctor of Osteopathy, Endocrinologist, Gastroenterologist, Geriatrician, Nephrologist, Oncologist, Pulmonologist, Rheumatologist, Psychiatrist/Psychologist, Neurologist, Alternative Care Provider.
- Personal/family resources include insurance status
    - Insurance status (INSCOV06) is defined as presence of health insurance coverage whether private, public or uninsured.
- Health care practitioners' characteristics consist of the health care practitioners' gender, race and ethnicity.

    - Health Care Practitioner's gender (GENDRP42) is defined as male or female.
    - Health Care Practitioners race included Hispanic (HSPLAPR), White (WHITPR), Black (BLCKPR), Asian (ASIANPR), Native American (NATAMP), Pacific Islander (PACISP), and other race (OTHRCP).
    - Health Care Practitioner's ethnicity (HSPLAP42) is defined as Hispanic or non-Hispanic.
- Community Resources include usual source of care location and transportation mode.
    - Usual Source of Care Location (LOCATN42) is defined as the location/place of the usual source of care. The three choices were office, hospital clinics and hospital's emergency room.
    - Transportation Mode (GOTOUS42) is defined as the way of getting to the usual source of care provider with the following choices: self driven, is driven, public transportation and walking.

Health Behaviors

Health Behaviors include health services use and health practice.

- Health Services Use is defined as the total number of office based-medical provider visits and outpatient-based visits reported for 2006.
    - Office based visits (OBTOTV06) is defined as the total number of office-based medical provider visits reported for 2006.

  - Outpatient visits (OPTPTV06) is defined as the total number of reported visits to hospital outpatient departments reported for 2006.

- Health Practice includes smoking habit

  - Smoking (ADSMOK) is defined whether the person does or does not currently smoke within the past 12 months.

Health Outcomes

Health Outcomes include physical health status and mental health status originally taken from Short Form 12 (SF-12) and was self administered questionnaire.

- Physical Health Status is defined as the Physical Component Summary (PCS) of Short Form Twelve Items (SF-12 v2-Imputed).

- Mental Health Status (MCS) is defined as the Mental Component Summary (MCS) of Short Form Twelve Items (SF-12v2-Imputed).

APPENDIX B

Definition of Terms Used MEPS HC-105 2006 Glossary

Appendix B: Definition of Terms Used

MEPS HC-105 2006 Glossary

Access to Care (AC) -provides information on the characteristics, barriers and satisfaction on usual source of care.

Condition Enumeration (CE) -contains information on summary assessment of person’s physical and mental health.

Demographical Data (RE) -reenumeration that has two parts and refers to the process of collecting eligibility and demographical data such as race, ethnicity, educational attainment, and military status.

Health Condition- presence of health problem that results to malfunctioning of the body or organs and can either be physical or mental in nature.

Health Insurance (HX) -provides information on private and public health insurance plan. Other information include the length of time if individuals are uninsured individuals

Health Care Practitioners/Professionals/Providers -persons providing medical treatment or nursing care or therapy to individuals with health conditions.

Health Status (HE) –assessment of physical and mental health status that includes limitations in activities of daily living and instrumental activities of daily living, physical limitations, activity limitations, and mental impairments.

Household Component (HC) -a main component of MEPS composed of data on the individual household members and medical providers. Data include demographic characteristics, health conditions, health status, use of medical care services, charges and payments, access to care, satisfaction with care, health insurance coverage, income and employment.

Hyperlipidemia- also known as high cholesterol or need to lower fat in the diet.

Hypertension -a long term high resting systolic blood pressure (higher than 140) and high diastolic blood pressure (higher than 90); also known high blood pressure

Medical Condition -a physical or mental problem identified by health professional.

Medical Expenditure Panel Survey (MEPS) -a national survey on health care use an expenses of U.S. civilian, non-institutionalized population.

Medical Provider Visits (MV) -provides information on nature of visits, type of health professional, time spent with the health professional, health conditions requiring medical provider services, surgical procedures, and prescription of medications.

Outpatient Department (OP) -any outpatient visits that includes information on the nature of contact, type of care received, health conditions requiring outpatient services, treatments, surgical procedures and prescription of medications.

Priority Conditions (PC) -provides information on select group of medical conditions subdivided into long term, life threatening conditions (i.e. hypertension, high cholesterol, ischemic heart disease) and chronic manageable conditions (i.e. arthritis, stomach ulcers, back problems of any kind).

Usual Source of Care (USC) -a particular place or medical professional that a person would go for physical or mental problems.