

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

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Abstract

Background: Persons with mental disorders experience numerous disparities in healthcare. Understanding disparities present in the usual source of care, health services use, and health outcomes is imperative. **Objectives:** Study aims were to examine relationships among population characteristics, health behaviors, and health outcomes; and to determine the differences in the usual source of care and health outcomes in persons with and without self-reported mental disorders. **Methods:** 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, physical illnesses and co-morbid mental disorders and physical illnesses. **Results:** The 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 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 ($p=.001$). **Conclusion:** Mental status of individuals without mental disorders was better than those with mental disorders.

Keywords: perceived mental health status; health outcomes; mental disorders

Background and Significance

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). Mental disorders, although treatable, are listed as a major public health concern due to the alarming increase of individuals who experience from them (Healthy People, 2020). Disparities in the treatment of individuals with mental disorders remain an issue because, although mental disorders are acknowledged, the number of mental health specialists available to treat them is inadequate (National Center for Health Statistics, 2020).

Individuals with mental disorders often have unmet service needs for both mental and physical health care (Barrio et al., 2008; Garrett & Yemane, 2006; Palinkas et al., 2007). Two factors contributing to unmet service needs are lack of a regular source of health care and primary care physicians' difficulty referring patients for mental health/substance abuse services. These factors result in misdiagnosed, underdiagnosed, mistreated or untreated individuals (Shepherd, 2009).

Numerous investigators have examined accesses to mental and physical health care and mental health service use. Few, however, have examined access to physical health care for those individuals with mental disorders (Everett, Mahler, Biblin, Ganghuli, & Mauer, 2008; Tsay et al., 2008).

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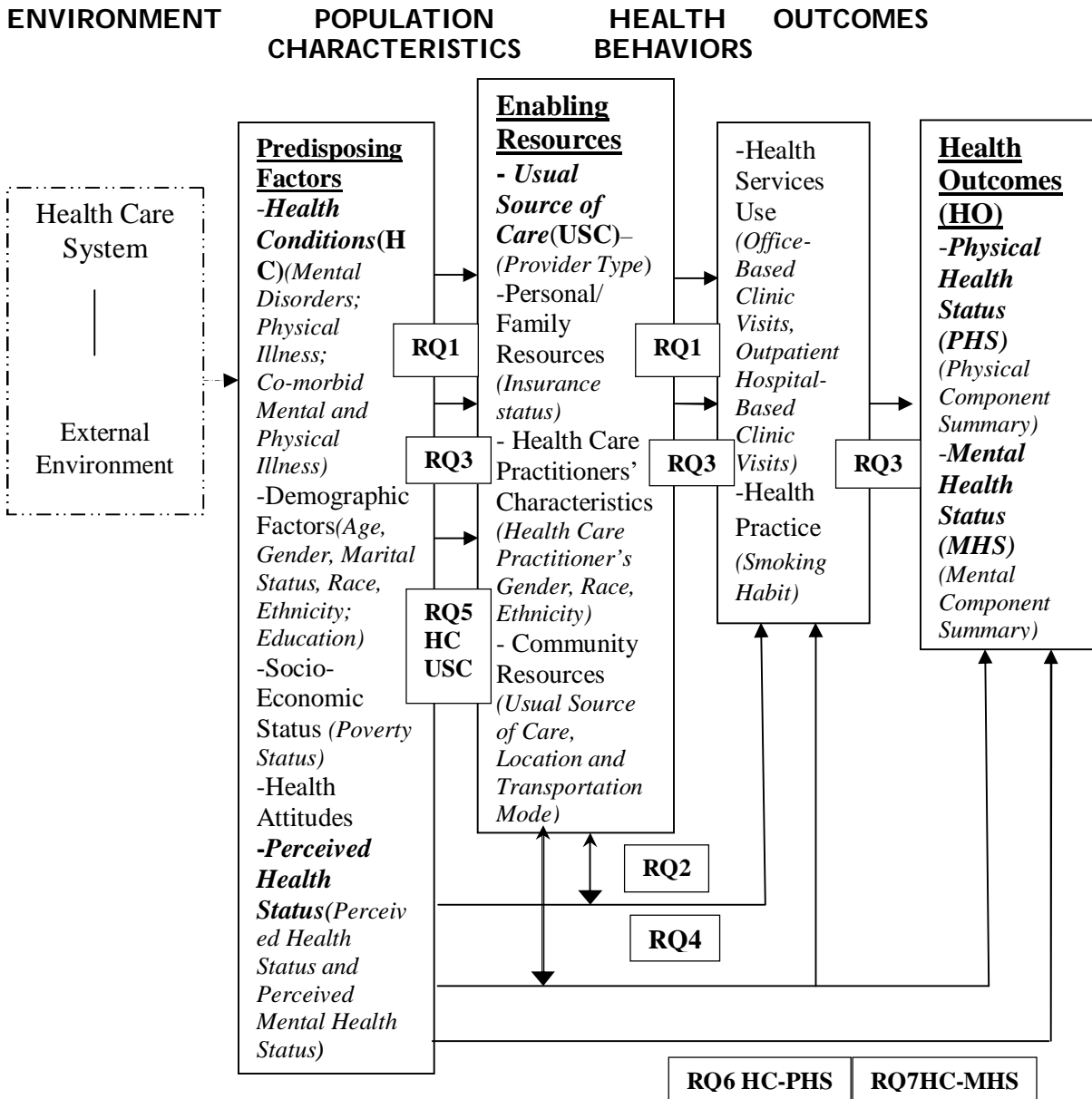
Currently, only few studies comparing the differences in usual source of care (USC) between adult non-institutionalized individuals with mental disorders and adult non-institutionalized individuals without mental disorders have been reported (Everett, Mahler, Biblin, Ganghuli, & Mauer, 2008; Baller, McGinty, Azrin, Juliano-Bult, & Daumit, 2015; Stobbe, Wierdsma, Kok, Kroon, Roosenschon, Depla, & Mulder, 2014). Similarly, studies comparing differences in 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.

Morbidity and mortality among individuals with mental disorders will continually increase if mental 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 may contribute to health disparity in this population. Understanding health care disparities, particularly differences in the usual source of care and its relationship to physical and mental health status, is vital to developing and implementing health care interventions and policies to properly provide needed services for individuals with mental disorders (Studs, Stone, & Barber, 2006; Wiechelt, Delprino, & Swarthout, 2009; Xiao & Barber, 2007). Therefore, the ultimate goal of this exploratory study was to examine factors that affected health outcomes of individuals with mental disorders.

Review of Literature

A modified Behavioral Model of Health Service Use (BMHSU) (Andersen & Aday, Andersen 1995, Gelberg, Andersen & Leake, 2000, Rebhan, 2010) was used as the framework in this study. The main concepts in this study were population characteristics (predisposing factors and enabling resources), health behaviors (health services use and health practice) and outcomes (health outcomes). In this framework, presented in Figure 1, 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.

Figure-1: Modified Behavioral Model of Health Service Use (BMHSU)



Legend:

- Main Concept: **BOLD CAPITAL**
- Construct: **Bold underline**
- Main Variables of Interest: ***Bold Italic***
- Other Variables of Interest: Regular
- Specific Variable Definition: *Italic*
- Omitted Construct: Broken Lines

- Research Questions #1-7: **RQ1-RQ7**
- Arrows: Relationships: →
- Covariates: ↔

Relationships among the main concepts, constructs and variables are illustrated by means of arrows. 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.

Population Characteristics

Predisposing Factors

*Health Conditions*² such as physical illnesses, mental disorders and co-morbid medical conditions affect health behaviors. Thus, persons with these conditions use health services differently, and practice less beneficial health behaviors, such as smoking, more than do persons without these health conditions (McKeown & Colman, 2006; Coultas, et al., 2007; Keizer, Gex-Fabry, Eytan, & Bertschy, 2009). Most investigators have focused on the association between health attitudes and health conditions such as mental disorders and physical illness and health service use (Brunero & Lamont, 2010; Jang, Chiroboga, & Okasaki, 2009). Aside from health conditions, *socio-demographic factors*³, and *socio-economic status*⁴ are determinants of health services use (Shaikh & Hatcher, 2005). For example, health outcomes, ethnicity and age were found to be predictors of health services use in a longitudinal study among 310 Moroccan and Turkish migrants (Lamkaddem, Spreuuenberg, Deville, Foets, & Groenewegen, 2008) while gender, age, education, employment and socio-economic structure were significantly associated with physical and mental health status in 7,473 individuals with arthritis (Hill, 2007). A significant relationship between socio-economic status and health services use is a consistent finding (Miranda, McGuire, Williams, & Wang, 2008; Roy-Byrne, Joesch, Wang, & Kessler, 2009; Tello, Jones, Bonizzato, Mazzi, Amadeo, & Tanzella 2005; Varga, Piko & Fitzpatrick, 2014). Age, gender, marital status, race, ethnicity, and education level are predictors of poverty and warrant further research to determine the effect of socio-economic status and health services use in improving health outcomes in persons with mental disorders (Patel & Kleinman, 2003; Gupta, de Wit, & McKeown, 2007; Lund et al., 2010). What remains unexplored are 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 to better understand disparities in mental health care and services use (Sareen et al., 2006, Zeber, Copeland, McCarthy, Bauer, & Kilbourne, 2009).

*Perceived health status*⁵ affects health behaviors and health outcomes (Rahmqvist, 2001; Weigers & Drilea, 1999). Recently, Alverson and Kessler (2012), in a sample of 84 adults found that those who were older, with number of medical conditions, no health insurance and lower income status have poorer health status, have issues with employment and access to care compared to general population. Additionally, Galloway & Henry (2014) reported that people living in rural areas have poorer perceived health status because of lack of community resources and poor physical and mental health outcomes. However, what influences perceived health status still is illusive. For example, the impact of education level, health care practitioner's characteristics, and racial/ethnic disparities on perceived health status has not been studied (Javier, Huffman, Mendoza, & Wise, 2010). Moreover, research examining the relationships between perceived health status, usual source of care and health outcomes is limited (Rabin et al., 2009 & Bethel, Foreman, & Burke, 2011).

*Health attitudes*⁶ include opinions about health insurance coverage and the decisions to seek treatment. Health attitudes impact health services use. Evidence supports an association between health insurance coverage and medical conditions. Health attitudes have received less attention, so little is known about the relationship between health attitudes on health insurance, health services use and health outcomes. People without health insurance are less likely to use preventive health care services, thus decreasing the likelihood of early recognition of health problems (Kass et al., 2007 & Benerjee et al., 2010).

Enabling Resources

Provider type, such as the kind of facility and the site's health care providers are components of *usual source of care*⁷ in this study.

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The concept of usual source of care has been used interchangeably with access to care and location of health care services. Sites for medical care include community clinics, emergency rooms, hospital clinics, sheltered-based clinics and street outreach teams (Garibaldi, et al., 2005; Weinick, Zuvekas, & Drilea, 2006).

Racial-ethnic disparities in usual source of care were evident (Washington et al., 2005). Samples in most studies on usual source of care have been Veterans homeless and older people, and people living in large urban locations (Washington et al., 2005; Weinick et al., 2006). Financial barriers such as unaffordable *health insurance*⁸ are major issues in mental health services use. Most studies on insurance explored the association of insurance coverage with the type of medical provider (Cheng, 2005; Sharma, Haas, & Stano, 2003; Wilper et al., 2009). People with no insurance or with public insurance were more likely to have inadequate usual source of care, and experience provider-level barriers when seeking care compared to people with insurance (Han, Thiede, Kemmick, Pintor, Alarcon-Expinoza, & Baines Simon, 2015; Miller, Kirk, Kaiser, & Glos, 2014).

*Health care provider*⁹ and client racial and ethnic similarity have an impact on individuals seeking health care service use for physical and/or mental problems. This similarity is even more important when interacting with patients from diverse populations. In order to alleviate barriers related to health care provider's characteristics and improve health outcomes, Hahm, Speliotics, & Bachman (2008) and Ndetan et al., (2010) suggested to have adequate training on assessment, and treatment of patients from diverse populations with physical illness and mental disorders. Differences in demographic factors, usual source of care, health status and similarity in patient-provider characteristics have not been well explained (Johnson, Saha, Arbelaez, Beach, & Cooper, 2004, Cooper & Powe, 2004; Desai, Rosenheck, & Craig, 2005; Flynn, Budd, & Modelski, 2008).

In this study, *community resources*¹⁰ included the *usual source of care locations*¹¹ and *transportation mode*¹². The usual source of care location can present a challenge with individuals with mental disorders. Research comparing the use of different locations for usual source of care (e.g. physician offices, hospital clinics and emergency rooms) and its effect on health behaviors and health outcomes is much needed focus (Weinick, Burns, & Mahrotra, 2010). Individuals with disabilities, especially those with mental disorders are less likely to have their own transportation (Shook, 2005). Shook (2005) reported that the transportation barriers among 75 adult patients in a federally funded community health center were lack of car ownership, longer distance travel, and reliance on public transportation. These transportation barriers 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).

Research on the usual source of care is limited (Smith & Bartell, 2004; Richardson & Norris, 2010) and studies that examine the relationships of health insurance, the types of medical providers and health outcomes among individuals with mental disorders are needed (Sharma, Haas, & Stano, 2003; Legorreta et al., 2004; Cheng, 2005). The link between community resources particularly usual source of care location and transportation mode and health outcomes remain unclear. Future studies must use diverse populations and large sample size to promote health outcomes and reduce health disparities (Kilbourne et al., 2008).

Health Behaviors

Health behaviors include *health services use*¹³ and *health practice*¹⁴. In this study, *health services use* included the total number of reported visits to outpatient and office-based clinics. The health practice chosen for this study was the participant's *smoking*¹⁵ habit. An identified need exists for more research exploring the ongoing issue of availability and accessibility of diversified health services resources among the U.S. adult population lingers as most studies focused on Hispanic population (Wagner & Guendelman, 2000; Vega, Kolody, & Aguilar-Gaxiola, 2001; Burgos, Schetzina, Dixon, & Mendoza, 2005).

⁸ Italicized words are study variables

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Variations in the types of mental health treatment settings, and the quality of health care services were possible reasons for inadequate mental health services use rather than lower levels in education or socio-economic status (Adler & Stewart, 2010; Roy-Byrne et al., 2009). Racial and ethnic disparities in mental health services use remain a public health concern as demonstrated in two studies involving youths (Garland et al., 2000 & Garland et al., 2005). Health care costs and perceived difficulties in accessing medical care specialists were identified as reasons for avoiding mental health services use (Zeber, Copeland, McCarthy, Bauer, & Kilbourne, 2009). Exploring the differences between age groups and actual health services use, perceived barriers to usual source care may provide a different perspective on a complex phenomenon (Garibaldi, Conde-Martel, & O'Toole, 2005; Gelberg et al., 2000; Ledoux, Barnett, Garcini, & Baker, 2009).

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 between health services use, usual source of care, perceived health status, and smoking status (N=6,149). Smokers were more likely to have no or limited insurance coverage, irregularly see a health care provider, report poor perceived health status and have more depressive symptoms. The researchers' findings supported that smoking has negative effects to usual source of care, health care services use and perceived health status. More recently, Trosclair and Dube (2010) reported that current smokers were more likely to have mental disorders.

Health Outcomes

In this study, health outcomes include *physical health status*¹⁶ and *mental health status*¹⁷. Population characteristics (predisposing factors and enabling resources) and health behaviors (health services use and smoking) influence health outcomes. Investigators have 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* (Dury, 2015; Everett, Mahler, Biblin, Ganghuli, & Mauer, 2008; Meyer, Castro-Schilo, & Aguilar-Gaxiola, 2014). 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 (Dawson, Grant, Chou, & Stinson, 2007).

A significant association between health services use and mental health status has been reported in studies involving Veterans (Timko, Chen, Sempel, & Barnett, 2006; Chen, Barnett, Sempel, & Timko, 2006). The severity of having a mental health condition affects health services use and mental health status among individuals with mental disorders (Xie, McHugo, Helmstetter, & Drake, 2005; Anderson, et al., 2010). 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 (Anderson et al., 2010).

In summary, most studies reviewed used varied sample size (e.g., 8-531) from convenience samples to large samples (e.g., ≤1,000 -25 million) and from national surveys (e.g., Medical Expenditure Panel Survey, National Comorbidity Survey Replication). Studies with small sample size were valuable in highlighting the mental health 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, missing in the literature are descriptions of the relationships of health conditions, socio-demographic factors, health attitudes, perceived health status, usual source of care, health services use, smoking, and health outcomes. This study adds to knowledge because most studies examined the relationships of a few of these constructs but there was no study that examined the relationships of all of combination of many of these constructs. Additionally, no study was found 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). Evidence on 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 warrant a study with focusing these aspects of need.

¹⁶ Italicized words are study variables

¹⁷ Italicized words are study variables

Research Questions

The research questions were: Research Question 1 (RQ1): What is the relationship between population characteristics and health behaviors? Research Question 2 (RQ2): What is the relationship between population characteristics and health behaviors controlling for selected moderating factors, [enabling resources]? Research Question 3 (RQ3): What are the relationships among population characteristics, health behaviors, and health outcomes?

Research Question 4 (RQ4): What are the relationships among population characteristics, health behaviors, and health outcomes controlling for selected moderating factors [enabling resources]? Research Question 5 (RQ5): What is the difference in usual source of care between individuals with and without self-reported mental disorders? Research Question 6 (RQ6): What is the difference in physical health status between individuals with and without self-reported mental? Research Question 7 (RQ7): What is the difference in mental health status between individuals with and without self-reported mental disorders and individuals without mental disorders?

Methods

Design

A secondary analysis of existing data collected from the national public data base Medical Expenditure Panel Survey (MEPS) of 2006 was performed. 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. MEPS HC-104 containing a list of medical conditions in 2006 (MEPS Survey Background, 2010) and the 2006 Consolidated Data File of Household Component (HC-105) containing survey questionnaires related to specific topics such as access to care, health insurance, health status and hospital visits were used in this study. 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.

Sample

The sample consisted of U.S. civilian non-institutionalized adults aged between 18 and 64 years old regardless of gender, educational status, marital status, and race-ethnic background (N=622). The sample was selected based on presence of the following health conditions: mental disorders (MD), physical illnesses (PI), and co-morbid mental disorders and physical illnesses (CM). The MD group consisted of individuals with schizophrenias, psychoses, and mood disorders but without cancer, dementia or emergent conditions or surgery or fractures (n=114, 18%). The PI 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, 76%). The CM consisted of individuals with both a mental disorder and a physical illness (n=39, 6%). Mental disorders and physical illnesses were determined according to ICD-9-CM. A sample size of 622 was considered adequate based on the effect size of .15, alpha=.05 and power of 0.8.

Data Analysis

The Statistical Package for Social Sciences (SPSS) Program version 18.0 was used in analyzing the data. Descriptive and exploratory analyses were undertaken to examine the characteristics of the participants, describe the relationships between and among the variables and the differences between the three health condition groups. A general linear model (GLM) or multivariate analysis of variance (MANOVA) was used to answer RQ1 and RQ3 while a multivariate analysis of covariance (MANCOVA) was used to answer RQ2 and RQ4. Kruskal-Wallis test was used to answer RQ5 as data were ordinal in nature. Univariate analysis of variance (ANOVA) was used to analyze RQ6 and RQ7. ANOVA, MANOVA and MANCOVA were used in analysis because of the exploratory nature of the study evaluating whether multiple dependent variables vary across levels of factors (Green & Salkind, 2008). Level of significance was set at $p < .05$.

Results

For RQ1, MANOVA results as shown in the Table-1 indicated that four predisposing factors, health conditions, ethnicity, health attitudes, perceived mental health status, and one enabling resource, usual source of care location had a significant effect on health behaviors (combined dependent variables of office-based clinic visits, outpatient hospital-based clinic visits, and smoking habit).

Population characteristics, taken in totality, were not related to health behaviors. However, Bonferroni post hoc analysis as shown in the Table-2 revealed some significant differences among study variables. Office-based clinic visits differed for health conditions, and for perceived mental health status. Outpatient hospital-based clinic visits differed for ethnicity and health attitudes. Smoking differed for health attitudes.

Table-1: RQ1 MANOVA Results

Variables		Wilks'Λ	F	p
Dependent (DV)	Independent (IV)			
Health Behaviors	Health Conditions	.50	(6, 54) =3.7	.003
Health Behaviors	Ethnicity	.50	(9, 65) =2.45	.018
Health Behaviors	Health Attitudes	.126	(42, 81) =2.0	.005
Health Behaviors	Perceived Mental Status	.213	(12, 72) =4.7	.000*
Health Behaviors	Usual Source of Care Location	.738	(3, 27) =3.2	.04

Table-2: RQ1 Univariate ANOVA and Bonferroni Post Hoc Analysis Results

Variables		F	p
Dependent (DV)	Independent (IV)		
Office-based clinic visits	Health Conditions	(2, 703) =5.94	.007
Office-based clinic visits	Perceived Mental Status	(4,769.48) =6.50	.001
Outpatient hospital-based clinic visits	Ethnicity	(42, 81) =2.0	.005
Outpatient hospital-based clinic visits	Health Attitudes	(14, 1.63) =2.192	.036
Smoking	Health Attitudes	(14, 1.794) =2.2	.034

* $p < .000$

For RQ2 as shown in the Table-3, some effects were significant such as two predisposing factors (marital status, and perceived mental health status) on the combined health behaviors and four covariates (enabling resources) on the combined health behaviors. Follow-up univariate ANOVA results as shown in the Table-4 indicated that health behavior (smoking) was influenced significantly by the covariate enabling resources (health care practitioner's gender and usual source of care; health care practitioner's gender and usual source of care location; usual source of care and transportation mode; and health care practitioner's gender and usual source of care). When taken as a whole, no overall significant relationships between independent variable population characteristics (predisposing factors), and combined dependent variable of health behaviors controlling for selected moderating factors (enabling resources). However, when examined individually, the most significant relationship was smoking and covariates health care practitioners' gender and usual source of care location ($p = .000$).

Table-3: RQ2 MANCOVA Results

Variables		Wilks'Λ	F	p
Dependent (DV)	Independent (IV)			
Health Behaviors	Marital Status	.95	(3, 138) =2.7	.049
Health Behaviors	Perceived Mental Status	.93	(3, 138) =3.5	.01
Health Behaviors	Covariates Health Care Practitioner's Gender & Usual Source of Care	.92	(3, 138) =4.031	.009
Health Behaviors	Covariates Health Care Practitioner's Gender & Usual Source of Care Location	.88	(3, 138) =6.031	.001
Health Behaviors	Covariates Usual Source of Care & Transportation Mode	.81	(9, 336) =3.357	.001
Health Behaviors	Covariates Health Care Practitioner's Gender, Usual Source of Care & Transportation Mode	.88	(3, 138) =6.448	.000*

* $p < .001$

Table-4: RQ2 ANOVA Follow-Up Results

Variables		<i>F</i>	<i>p</i>
Dependent (DV)	Independent (IV)		
Smoking	Covariates Health Care Practitioner's Gender & Usual Source of Care	(1, 10) =13.38	.002
Smoking	Covariates Health Care Practitioner's Gender & Usual Source of Care Location	(2, 29) =5.125	.006
Smoking	Covariates Usual Source of Care & Transportation Mode	(2, 29) =2.22	.034
Smoking	Covariates Health Care Practitioner's Gender & Usual Source of Care Location	(2, 29) =6.496	.000*

**p* < .001

For RQ3, as shown in the Table-5 and Table 6, usual source of care location and dependent variable (DV) health outcomes (mental health status and physical health status) were the most significant (*p* = .000). There were no overall relationships between study variables. However, some significant relationships between population characteristics, predisposing factors (health conditions, perceived mental health status and enabling resources/usual source of care location) and combined dependent variables of health outcomes (physical health status and mental health status) existed, other relationships were non-significant.

Table-5: RQ3 MANOVA Results

Variables		Wilks' Λ	<i>F</i>	<i>p</i>
Dependent (DV)	Independent (IV)			
Outcomes	Health Conditions	.88	(4, 186) =3.1	.017
Outcomes	Perceived Mental Status	.81	(8, 186) =2.4.7	.016
Outcomes	Usual Source of Care Location	.81	(2, 93) =10.58	.000*

p* < .001Table-6: RQ3 ANOVA Follow-Up Results**

Variables		<i>F</i>	<i>p</i>
Dependent (DV)	Independent (IV)		
Outcome Physical Health Status	Usual Source of Care Location	(1,1,362)=14.47	.000*
Outcome Mental Health Status	Health Conditions	(2, 494) =5.5	.005
Outcome Mental Health Status	Perceived Mental Status	(4, 300) =3.3	.013
Outcome Mental Health Status	Usual Source of Care Location	(1, 1388) =15.51	.000*

**p* < .001

For RQ4 as shown in the Table-7 and Table-8, when taken as a whole revealed no overall significant relationship existed between predisposing factors, and health behaviors on health outcomes controlling for selected moderating factors enabling resources. However, when examined individually, the most significant relationship was predisposing factor perceived health status and physical health status outcome (*p* = .000). Therefore R4 was non-significant. For RQ5, overall, there were no differences in usual source of care between individuals with self-reported mental disorders and individuals without mental disorders. Kruskal-Wallis test revealed majority of participants used either the hospital clinic or the outpatient department as their usual source of care (*n* = 213, 54%). Individuals with mental disorders (MD) preferred the hospital clinic or outpatient department as their usual source of care (*n* = 59, 66%) more than individuals with physical illness (PI) (*n* = 202, 52%) or co-morbid mental disorder and physical illness (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%).

For RQ6, ANOVA result 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. Therefore, R6 was non-significant.

Table-7: RQ4 MANCOVA Results

Variables		Wilks' Λ	F	p
Dependent (DV)	Independent (IV)			
Outcomes	Health Conditions	.94	(2, 136) = 4.7	.011
Outcomes	Race	.93	(2, 136) = 5.0	.008
Outcomes	Perceived Health Status	.83	(2, 136) = 13.5	.000*
Outcomes	Perceived Mental Health	.85	(2, 136) = 12.3	.000*
Outcomes	Total Office-Based Clinic	.89	(2, 136) = 7.7	.001
Outcomes	Covariates			
	Usual Source of Care	.92	(2, 136) = 5.7	.004
Outcomes	Covariates Health Care Practitioner's Gender & Health Care Practitioner's Ethnicity	.905	(6, 272) = 2.32	.034
Outcomes	Covariates Health Care Practitioner's Gender & Usual Source of Care			
	Location	.95	(2, 136) = 3.36	.36
Outcomes	Covariates Health Care Practitioner's Ethnicity & Usual Source of Care			
	Location	.91	(4, 272) = 3.33	.001

* $p < .001$

Table-8: RQ4 ANOVA Follow-Up Results

Variables		<i>F</i>	<i>p</i>
Dependent (DV)	Independent (IV)		
Outcome			
Physical Health Status	Health Conditions	(1, 393) =6.53	.012
	Race	(1, 605) =10	.002
	Perceived Health Status	(1, 1546) =25.6	.000*
	Perceived Mental Health	(1, 521) =8.65	.004
	Total Office-Based Clinic Covariates	(1, 877) =14.54	.000*
	Usual Source of Care Location	(1, 560) =9.3	.003
	Covariates Health Care Practitioner's Ethnicity	(4,172) =2.86	.026
	Covariates Health Care Practitioner's Gender & Health Care Practitioner's Ethnicity	(3, 227) =3.76	.012
	Covariates Health Care Practitioner's Ethnicity & Usual Source of Care Location	(2, 391) =6.5	.002
	Covariates Health Care Practitioner's Gender, Health Care Practitioner's Ethnicity & Usual Source of Care	(1, 263) =4.378	.038
Outcome			
Mental Health Status	Health Conditions	(1, 535) =5.67	.019
	Perceived Mental Health	(1, 824) =8.74	.004
	Office Based Clinic Visits	(1, 469) =4.98	.027
	Covariates Usual Source of Care Location	(1, 504) =5.32	.022
	Covariates Health Care Practitioner's Gender & Usual Source of Care Location	(1, 582) =6.17	.014

* $p < .001$

For RQ7, the ANOVA was significant, $F(2, 619) = 21.68, p = .000$. Follow-up tests were conducted to evaluate pairwise differences among the mental health status mean scores as shown in the Table-9 on the 95% confidence intervals for the pairwise differences, as well as the means and standard deviations for the three health conditions. Bonferroni post hoc comparisons indicated that there were significant differences between the mental health status mean scores and health condition groups. Individuals with physical illness had a higher mental health status score than the individuals with mental disorders and co-morbid mental disorders and physical illness.

Table-9: 95% Confidence Intervals of Pairwise Differences in the Health Conditions

Mental Health Status	M	SD	Mental Disorders	Physical Illness
Mental Disorders	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

In summary, although some significant relationships existed among the study variables, RQ7 was the only one that yielded with significant differences. When independent variables considered composites, no significant relationships were found. When viewed as unique variables, some relationships were significant. Perceived mental health status remained significant on health behaviors and outcomes after controlling for enabling resources (usual source of care –provider type, insurance status, health care practitioners' characteristics and community resources). A significant difference was found in mental health status between individuals with self-reported mental disorders and individuals without mental disorders.

Discussion of Findings

The most significant finding in this study consistent with other studies indicated that individuals with mental disorders were different in perceived mental health status and mental health status outcome (Al-Windi, 2005, Sareen, et.al 2006; Sorkin, Tan, Hays, Mangione, & Ngo-Metzger, 2008; 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 illnesses would be expected to rate their perceived mental health and mental health outcome higher than their physical health status because of their existing physical needs (Brown, Ang, & Pebley, 2007; Mozumdar & Roy, 2010).

Several studies support the relationship of perceived mental health status and mental health status outcome (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 worsened in their physical and mental health status due to issues on accessing usual source of care. 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). Of particular note, the effects of the community resources on health outcomes would be a direction of study to address health service use disparities (Garibaldi et al., 2005; Hwang & Henderson, 2010; Ouimete et al., 2007; Stefanacci & Podrazik, 2005).

Findings from this study indicated that after controlling for enabling resources (usual source of care), a significant relationship between perceived mental health status and health behaviors (health service use and smoking) 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 (Carper & Machlin, 2009; Devoe, Wallace & Fryer, 2009; Kearns & Ji, 2007; Stagnitti, 2009; Xu, 2002). 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 (Johnson et al., 2004; Park & Grindel, 2007; Perilla, Norris, & Lavizzo, 2002; Rubin, Peyrot, & Siminerio, 2006). Racial-ethnic disparities could be diminished 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 (Kline & Mehler, 2006). Harrison et al. (2008) asserted that the key factor to improved health outcomes was contingent upon the delivery of evidence-based practice provided by qualified health care practitioners and not the location of usual source of care. Integration of mental and physical care in order to address the person's health outcomes was suggested as a solution (Zeber, Copeland, McCarthy, Bauer, & Kilbourne, 2009).

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). 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 (Hwang & Henderson, 2010; Philipps, Hammock, & Blanton, 2005).

In summary, the results of this study add insights about the perceived health status, usual source of care, health behaviors and health outcomes of individuals 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 results of the study provided support for the impact of perceived mental health status on health behaviors and health outcomes as well as reinforced 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.

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.

Due to the cross-sectional design of the study, feedback loops were negated and one time linear relationships were evaluated. A key theoretical construct in the Behavioral Model of Health Service Use (BMHSU) was environment. In this study, the influence of the environment on health outcomes was recognized but the environment was not measured. The Medical Expenditure Panel Survey (MEPS) used in the study was conducted across the United States. The characteristics of the environment would have been variable in different regions, making them difficult to describe and quantify. The variables in the environment were not available in the MEPS data source and this may be considered as a limitation.

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 factors that affect health practice and outcomes so students are aware of the barriers that can impact potential health outcomes of individuals with mental disorders. Awareness of the complexity of the relationship of these factors may support nursing interventions that eliminate barriers to care and promote better health practices and mental health outcomes. In doing so disparities related to health care can be eliminated and morbidities and mortalities among individuals with mental disorders will be reduced.

Knowledge about the strategies to reduce health care barriers and health services use disparities among individuals with mental disorders, physical illness and co-morbid mental disorders and physical illness 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.

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