Curriculum Vitae

Name: Kyeongmo Kim

Contact Information: kmkmkim@gmail.com

Degree and Date to be Conferred: Ph.D., 2017

Collegiate Institutions Attended:

2017	Ph.D., University of Maryland, Baltimore School of Social Work, Baltimore, MD
2006	M.S.W., Washington University in St. Louis Brown School of Social Work, MO
2002	M.A., Yonsei University Department of Social Welfare, Seoul, Korea
2000	B.A., Korea University German Language and Literature, Seoul, Korea

Professional Publications:

Lehning, A., Kim, K., Smith, R., & Choi, M. (in press). Does economic vulnerability moderate the association between transportation and social participation restrictions in later life? *Ageing & Society*.

Lehning, A., Smith, R., & Kim, K. (2017). "Friendly" initiatives: An emerging approach to improve communities for vulnerable populations. *Journal of Policy Practice, 16,* 46-58. doi: 10.1080/15588742.2015.1125331

Lee, M., & Kim, K. (2016). Older adults' perceptions of age-friendliness in Busan Metropolitan City. *Urban Policy and Research.* Advance online publication. doi: 10.1080/08111146.2016.1140031

Kim, K., Lehning, A., & Sacco, P. (2016). Assessing the factor structure of well-being in older adults: Findings from the National Health and Aging Trends Study. *Aging and Mental Health, 20,* 814-822. doi: 10.1080/13607863.2015.1037245

Hong, M., Kim, K., & Casado, B. (2016). Psychometric evaluation of the caregiver self-efficacy scale with Korean Americans. *Social Work in Health Care.* Advance online publication. doi: 10.1080/00981389.2016.1231154

Kim, K., & Casado, B. (2016). Preventive health services utilization among Korean Americans. *Social Work in Public Health.* Advance online publication. doi: 10.1080/19371918.2015.1137508

Kim, K., & Lee, M. (2015). Depressive symptoms among older adults living alone: The role of community characteristics. *International Journal of Aging and Human Development, 80,* 248-263. doi: 10.1177/0091415015590315

Kim, Y., Kim, K., & Lee, S. (2015). Testing the self-efficacy questionnaire with Korean children in institutionalized care. *Research on Social Work Practice.* Advance online publication. doi: 10.1177/1049731515606219

Petr, C., Harrington, D., Kim, K., Black, B., Cunningham-Williams, R., & Bentley, K. (2015). Quality indicators and expected outcomes for social work PhD programs: Perceptions of social work students, faculty, and administrators. *Journal of Social Work Education, 51*, 648-667. doi: 10.1080/10437797.2015.1076272

Ko, J., Bailey-Kloch, M., & Kim, K. (2014). Interprofessional experiences and attitudes toward interprofessional health care teams among health sciences students. *Social Work in Health Care, 53*, 552-567. doi: 10.1080/00981389.2014.903884

Kim, K., & Ko, J. (2014). Attitudes toward interprofessional health care teams scale: A confirmatory factor analysis. *Journal of Interprofessional Care, 28*, 149-154. doi: 10.3109/13561820.2013.857645

Lee, M., & Kim, K. (2014). Prevalence and predictors of self-neglect among living alone older adults in South Korea. *International Journal of Aging and Human Development, 78*, 117-133. doi: 10.2190/AG.78.2.b

Professional Positions Held:

2011 to 2017	Graduate Research Assistant University of Maryland, School of Social Work, Baltimore, MD
2015	Instructor for SOWK 670 Social Work Research Course University of Maryland, School of Social Work, Baltimore, MD
2006 to 2011	Director of Suburban Office, Hanul Family Alliance, Chicago, IL
2003 to 2004	Social Worker, Dobong Community Center, Seoul, Korea

Special Awards:

2015	Grantmakers in Aging Fellowship
2013 to 2016	SAMHSA Mental Health & Substance Abuse Fellow through Council on Social Work Education Minority Fellowship Program
2012 to 2013	Pre-Dissertation Awardee, Association for Gerontology Education in Social Work (AGESW)

Abstract

Title of Dissertation: County Context and Mental Health Service Utilization among Older Racial and Ethnic Minorities

Kyeongmo Kim, Doctor of Philosophy, 2017

Dissertation Directed by: *Donna Harrington*, Ph.D., Professor, School of Social Work, University of Maryland, Baltimore

Underutilization of mental services by older racial and ethnic minorities is a growing concern in the United States, as it may have a huge impact on the older adults' well-being and generate significant financial costs. Using Andersen's (2008) Behavioral Model of Health Services Utilization, this study examined county contexts associated with mental health service use among older racial and ethnic minorities in the United States, controlling for individual characteristics. This study used the 2008-2012 Medical Expenditure Panel Survey linked with county-level data from the 2013-2014 Area Health Resources Files and the 2008-2012 Chronic Conditions Data Warehouse. This study included 1,143 Hispanic Americans (156 counties), 1,567 Black Americans (237 counties), and 422 Asian Americans (81 counties). Two separate multilevel logistic regressions for Hispanics and Blacks and one multiple hierarchical logistic regression for Asians were conducted to examine which factors were related to mental health service utilization among the three groups.

At the individual-level, better mental health status decreased the odds of using mental health services in all three groups. Higher individual income was a significant predictor of mental health service utilization for the Black and Asian samples but not the Hispanic sample. In addition, having a high school diploma significantly predicted mental health

service utilization only among older Hispanics. At the county-level, the findings varied across groups. A higher proportion of older adults in a county increased mental health service utilization among older Hispanics but decreased utilization among older Asians. In addition, a higher proportion of Black residents was related to decreased use of mental health services by older Blacks. The existence of community mental health centers in a county significantly predicted mental health service utilization by older Hispanics. This study suggests that county contexts may be helpful to understand mental health service utilization among older racial and ethnic minorities, even adjusting for individual-level characteristics. The findings varied across the three groups, indicating the need for further research. Social workers and policymakers should understand both individual- and county-level characteristics associated with mental health service utilization to develop tailored outreach programs as well as to develop and evaluate mental health policy.

County Context and Mental Health Service Utilization among Older Racial and Ethnic Minorities

by
Kyeongmo Kim

Dissertation submitted to the Faculty of the Graduate School of the
University of Maryland, Baltimore, in partial fulfillment
of the requirements for the degree of
Doctor of Philosophy
2017

Acknowledgements

First and foremost, I would like to thank my dissertation chair and mentor, Donna Harrington, for your unwavering support and mentoring throughout the program. I appreciate your patience and encouragement to achieve my professional goals. I am especially grateful to my dissertation committee: Drs. Casado, Cornelius, Lehning, and Sacco. Dr. Casado provided opportunities to develop and disseminate community-based research. You showed me how research contributes to improving the quality of life of ethnic minorities. Dr. Cornelius helped me reinforce my critical thinking on health disparities. Dr. Lehning always helped me remain focused on why my research questions were important to know, and four years of research collaboration with you built my foundation in research and scholarship; you shared your vivid experiences as a junior faculty and provided valuable advice to strengthen my professional and personal growth. Dr. Sacco, thank you for being insightful and very accessible like a trustful friend as well as a mentor; your detailed comments and guidance helped me a lot.

I am incredibly grateful to my family and friends. To my parents, I cannot express how much I appreciate your unconditional love and faith to me. Thank my brother and my sister, and their families for prays and support. I also thank my mother-in-law for her constant support and encouragement.

This study was generously supported by a pre-doctoral funding grant of the Council on Social Work Education Minority Fellowship Program funded by the Substance Abuse and Mental Health Administration. This study was possible by employing both the public and restricted data from the Medical Expenditure Panel Survey. I would like to thank data center coordinator Ray Kuntz and the Agency for Healthcare Research and Quality in Rockville, Maryland, for their guidance and cooperation.

My successful completion of the Ph.D. program would not be possible without the support of faculty and staff. I am grateful for Jen, your endless caring for my growth and success in the program. Special thanks to my Ph.D. cohort. My departed dear friends, Jeongseok and Sunmi, you were and will be with me at every step in the program, with the Mugunghwa tree.

Lastly, this dissertation is dedicated to my wife and best friend, Youngmi. Without your never-ending support, love, and a sense of humor, I could not complete my dissertation. I am very lucky to have you.

Table of Contents

List of Tables

List of Figures

CHAPTER 1: INTRODUCTION

The primary objective of this study is to examine the relationship between U.S. county context and mental health services utilization among older racial and ethnic minorities. Underutilization of mental services in this population is a growing concern in the United States (Sorkin, Murphy, Nguyen, & Biegler, 2016), but most existing research on this topic focuses on individual-level variables. An important premise of this study is that an understanding of the relationship between county-level context and mental health services utilization in this population is key to developing effective intervention strategies at the macro level. This chapter presents an overview of this issue and its implications for social work.

Statement of the Problem

The number of adults age 65 and older in the United States with mental health problems is growing, and approximately 14% to 20% of older adults are estimated to have mental illnesses such as depression and schizophrenia (Institute of Medicine [IOM], 2012). In addition, the overall population of older racial and ethnic minorities is expected to grow from about 10 million (22% of the U.S. older population) in 2014 to 44 million (45% of the U.S. older population) in 2060 (Federal Interagency Forum on Aging-Related Statistics, 2016). It is likely that there will be a corresponding increase in the number of older adults with mental health problems (Mackenzie, Pagura, & Sareen, 2010).

Findings regarding relative rates of mental illness in older racial and ethnic minority populations are inconsistent. Jimenez and colleagues (2010) found no significant differences in psychiatric illness rates in a 12-month period among older

Latinos, Blacks, and Whites. Similarly, a study using the 2001-2003 Collaborative Psychiatric Epidemiology Surveys found little difference in mental health diagnosis rates in the past 12 months between older Blacks (5.2%) and older Whites (4.6%) (Kim et al., 2013). However, a study using the National Latino and Asian American Survey found that 1 in 10 (9.7%) older Latino immigrants were diagnosed with anxiety disorders in the past 12 months as compared to 1 in 16 (6.2%) older Asian immigrants (Kim, Jang, Chiriboga, Ma, & Schonfeld, 2010). In addition, the 2005 California Health Interview Survey found that older racial and ethnic minorities have higher levels of mental illness compared to their White counterparts; for instance, compared to approximately one in six (14%) Whites, one in five (21%) to one in four (24%) African American, Asian American, and Latino respondents reported mental illnesses (Sorkin, Pham, & Ngo-Metzger, 2009). This study also found that older racial ethnic minorities (4%-8%) were more likely to report a serious mental illness than older Whites (3%) (Sorkin et al., 2009).

Although there are mixed findings about the prevalence of mental health issues of racial and ethnic minorities compared with Whites, they may be more likely to underuse mental health services. Dobalian and Rivers (2008) found that Hispanics (Odds Ratio (OR): 0.82) and African Americans[1] (OR: 0.72) underuse mental health services compared to Whites. Similarly, according to the National Latino and Asian American Survey, only 5.5% of Latino immigrant older adults and 4.7% of Asian American older adults used mental health services (Kim et al., 2010), whereas 10.7% of Whites 65 and

[1] Due to the inconsistency in labels used to describe racial and ethnic groups in the literature, the labels used in this dissertation are those used in the original studies (e.g., Latino/Hispanic and Black/African American).

over received mental health treatment or counseling (Agency for Healthcare Research and Quality [AHRQ], 2010a). In a study using the Collaborative Psychiatric Epidemiology Surveys, Latinos (9.6%), Asians (6.1%), and African Americans (7.7%) were less likely to use any mental health services during the past 12 months, compared to non-Hispanic Whites (14.6%) (Cook, Doksum, Chen, Carle, & Alegría, 2013). For specialist mental health care, the same pattern was observed: non-Hispanic Whites (8.6%) were more likely to have used specialty mental health services than Latinos (5.5%), Asians (2.9%), and African Americans (5.3%) in the past year (Cook et al., 2013).

With the growth in the number of older racial and ethnic minorities, underutilization of mental health services among those populations is a major concern. Underutilization of mental health services may delay the treatment of mental health problems, and untreated problems may have an impact on the well-being of an individual. In particular, older adults may not seek help because they consider depression as a normal part of aging (Centers for Disease Control and Prevention [CDC], 2017). However, untreated depression leads to disease burden and disability (Fuentes & Aranda, 2012) and may result in higher suicide and non-suicide mortality (National Alliance on Mental Illness [NAMI], 2009). In addition, untreated mental health problems have financial costs to the society because of unemployment, homelessness, and inappropriate incarceration (NAMI, 2006). The total cost for treating mental disorders was over $201 billion in 2013 (Roehrig, 2016) and the economic cost (e.g., lost earnings) due to serious

mental illnesses was $193 billion in 2002[2] (Kessler et al., 2008). Health care costs for older adults with depression were 50% higher than those for people without depression (Substance Abuse and Mental Health Service Administration [SAMHSA], 2011a).

Ethnic minority populations may underuse mental health services because they face individual, cultural, linguistic, and systemic barriers to accessing mental health services (SAMHSA, 2011b). Lack of insurance coverage, cultural and language barriers, and differences in socioeconomic status contribute to disparities in accessing mental health care (Cook et al., 2013). Chow and colleagues (2003) also point out that racial and ethnic minority populations may prefer to solve mental health problems within their own religious and cultural belief systems.

For example, African Americans are more likely to prefer non-medical professionals such as pastors and counselors for depression care compared to Whites (Akincigil et al., 2012). Having a church network can play a role in protecting against depression among older African Americans (Chatters, Taylor, Woodward, & Nicklett, 2015), and about half of African Americans with mental health needs utilize informal support as well as professional services (Sosulski & Woodward, 2013; Woodward, 2011). Older African Americans may distrust doctors, resulting in lower rates of mental health services use (Akincigil et al., 2012).

Older Latinos are also less likely to use professional mental health services compared to Whites (Akincigil et al., 2012). Older Latinos have negative perceptions of

[2] The cost estimate is based on annual indirect costs from the 2002 National Comorbidity Survey-Replication. To my knowledge, this is the most recent available data on indirect costs and the National Institute of Mental Health uses the 2002 estimates on their website (see https://www.nimh.nih.gov/health/statistics/cost/index.shtml).

seeking formal mental health services because of experiences of racial discrimination and stresses from immigration-related issues (Alvarez, Rengifo, Emrani, & Gallagher-Thompson, 2014). Education and economic resources are very important in utilization of mental health services (Gonzalez, Applewhite, & Barrera, 2015; Sorkin et al., 2016), but according to a study using 2001-2005 Medicare Current Beneficiary Survey data, older Latinos are less likely to have a high school diploma and are more likely to live below the 150% poverty line compared to other racial and ethnic groups, which may contribute to their underutilization of mental health services (Akincigil et al., 2012).

Similarly, older Asian Americans may prefer non-mental health professionals to solve their mental health concerns (Abe-Kim et al., 2007), because they do not feel comfortable talking to a mental health professional or they are concerned about having someone else find out about their symptoms (Sorkin et al., 2016). A majority of older Asians are foreign born so that it may be difficult for them to navigate the complex health and mental health care system in the U.S. (Sorkin et al., 2016). In addition, many older Asians lack health insurance or have limited insurance coverage, which may hinder them from seeking professional mental health care (Sorkin et al., 2016).

Although informal supports from family and friends are crucial to mental health, lack of professional expertise may hinder people from receiving appropriate medical care (Sosulski & Woodward, 2013). In addition, differences in help-seeking patterns result in disparities in depression diagnosis rates (Akincigil et al., 2012). Furthermore, there may not be enough culturally and linguistically appropriate mental health services providers to meet this need. These barriers hinder older racial and ethnic minorities from accessing and communicating with mental health service providers regarding their mental health

concerns. It is likely that these systemic barriers to mental health services lead to worse mental health outcomes among ethnic minority populations (SAMHSA, 2011b).

Mental health service utilization of older racial and ethnic minorities has been studied by many researchers, and reducing racial disparities in health care services has been identified as a national priority (Kim et al., 2013; U.S. Department of Health & Human Services [HHS], n.d.). To understand facilitators of and barriers to the use of mental health services among older racial and ethnic minorities, most research has focused on individual characteristics such as predisposing factors (e.g., age, gender, race and ethnicity), enabling factors (e.g., education, income), and need factors (e.g., health and mental health status) using Andersen's behavioral model of health service utilization (Kim et al., 2013). Although previous studies have advanced understanding of mental health service utilization among racial and ethnic groups, limited studies have explored the context in which racial and ethnic minority groups access mental health services.

Geographic differences may be an important contributing factor to racial and ethnic disparities in mental health (Kim et al., 2013). As Andersen and Davidson (2007) suggest, environmental characteristics, such as neighborhood socio-demographic characteristics, health policies, and the physical environment—in addition to individual characteristics—impact the use of health services and health outcomes. Health care resources such as mental health professionals and community mental health centers may be unequally allocated in different geographic areas (Cook et al., 2013). In addition, racial and ethnic minorities are more likely to live in economically disadvantaged areas that have fewer health care resources and may have fewer opportunities to access mental health care (Cook et al., 2013).

Previous studies have examined geographic areas to understand the context in which access to mental health care occurs, including the U.S. regions of the Midwest, Northeast, South, and West (Kim et al., 2013), states (Kim et al., 2013), counties (Cook et al., 2013; Stockdale et al., 2007; Wei, 2005), Census tracts (Stockdale et al., 2007), zip codes (Dinwiddie, Gaskin, Chan, Norrington, & McCleary, 2013), and exact address information (Stahler et al., 2009). Although census tracts or blocks may be more socioeconomically homogeneous than other geographic units, they are more likely to change with each U.S. decennial census (Singh, 2003). However, counties are more socio-politically and geographically stable compared to census tracts or blocks (Singh, 2003). Mental health care resources, such as a number of mental health professionals and community mental health centers vary across counties (Cook et a., 2013). Approximation of practice locations of mental health professionals is more accurate at the county-level than a zip code level because some practitioners may use a home address rather than an actual practice location (Ellis, Knorad, Thomas, & Morrissey, 2009). Counties are the smallest geographic entity to provide varieties of health care and social services within states as well as to consistently provide health, population, and socioeconomic statistics over time (DeFranco, Lian, Muglia, & Schootman, 2008). Information on mental health needs including mood disorders is also available at the county-level. In addition, mental health services are usually planned at the county-level (Ellis et al., 2009), and the government can implement health care policies and intervention at the county-level (DeFranco et al., 2008).

Thus, understanding the context where people reside is very important because access to mental health care occurs within a larger context. Although research

investigating the effects of neighborhood environment on mental health care has increased in recent years, most studies continue to focus on examining the impact of individual characteristics. By incorporating individual- and county-level influences, this study offers a more complete picture of mental health service utilization among older racial and ethnic minorities, informs development of intervention programs at the county-level, and provides recommendations for mental health policy to promote greater access to mental health services.

Purpose of the Study

The overall purpose of this study is to examine mental health service utilization among older racial and ethnic minorities. In particular, this study examines how county context is associated with mental health service utilization among these populations and whether there are differences in factors explaining mental health services utilization among older racial and ethnic minorities. The research questions of this study are: (a) What county contexts (i.e., county predisposing, enabling, and need factors) are associated with mental health service use among older Hispanics, controlling for individual characteristics; (b) What county contexts (i.e., county predisposing, enabling, and need factors) are associated with mental health service use among older Blacks, controlling for individual characteristics?; and (c) What county contexts (i.e., county predisposing, enabling, and need factors) are associated with mental health service use among older Asian Americans, controlling for individual characteristics? The goal of the study is to use the findings to help inform development of effective intervention strategies at the county level.

Relevance to Social Work

This study focuses on characteristics of county context such as county-level demographic composition, socioeconomic status, existence of mental health services providers, and health care policies that impact mental health services utilization among older racial and ethnic minorities, and thus aligns well with a social work perspective emphasizing "person-in-environment" (National Association of Social Workers [NASW], 2009). The study is relevant to social work education in that it is conducted through an ecological perspective that emphasizes exchanges between a person and the environment. Above all, the findings of this study may help social work students understand the particular challenges to mental health access faced by older racial and ethnic minorities as well as mental health disparities among those populations. The findings also can be a foundation to develop the knowledge and skills to design effective and culturally congruent interventions that can be delivered by community-based organizations to increase older racial and ethnic minorities' mental health services utilization.

This study may inform county-level intervention strategies to reach a larger number of older adults than those reached by individual intervention strategies alone (Julien et al., 2012). Incorporating individual and county factors to understand the use of mental health services provides a more complete picture for understanding mental health service utilization among older racial and ethnic minorities. Thus, this study may contribute to the existing literature that mostly has focused on individual characteristics to understand mental health service utilization. In addition, this study provides social workers with evidence to develop tailored community outreach strategies for older racial and ethnic minorities. Social workers may provide educational programs about the

importance of mental health services use in high-risk counties and collaborate with other stakeholders to increase access to mental health services. Informed by the evidence, social workers can develop mental health service delivery models that provide culturally competent mental health care to underserved older racial and ethnic minorities through collaboration with community stakeholders.

Summary

Older racial and ethnic minorities are less likely than older Whites to use mental health services, although they have similar or higher levels of mental health problems compared with older Whites. County context may play a role in explaining mental health service utilization among older racial and ethnic minorities. However, most research regarding mental health service utilization has focused on individual characteristics. Thus, this study aims to examine whether county context is associated with the use of mental health services by older racial and ethnic minorities and whether differences in county context explain levels of mental health service utilization among each older racial and ethnic minority group.

CHAPTER 2: THEORY AND LITERATURE REVIEW

This chapter presents a theoretical framework and the empirical research used to guide this study. The literature review focuses on understanding the role of county contexts in mental health service utilization among older racial and ethnic minorities from previous empirical studies.

Theoretical Framework

This study utilizes Andersen's (2008) Behavioral Model of Health Services Utilization as a theoretical framework. Andersen's model was developed in the late 1960s to predict and explain why people utilize health care services (Andersen, 1995), and the model has been widely used to explain mental health service utilization as an outcome (Andersen, 2008; Kim et al., 2013). In their systematic review of studies using Andersen's model conducted between 1998 and 2011, Babitsch, Gohl, and von Lengerke (2012) found that Andersen's model has been used most frequently to understand primary health care and mental health services utilization with large national quantitative datasets.

Andersen (1968) states that three components may play roles in explaining the use of health services: (a) people's predisposition to use services, (b) enabling or impeding factors for service use, and (c) their needs for the services. The predisposing component usually includes demographic characteristics (e.g., age, gender, marital status, education, and race/ethnicity); social structure reflecting a family's social location (e.g., employment, social class, occupation, and family size); and health beliefs (e.g., perceived values regarding health services, physicians, health, and health insurance; attitudes toward health services and physician use) (Andersen, 1968). The enabling component concerns an individual's ability to obtain health care services and includes family

resources (e.g., income, savings, health insurance, and regular source of care). Finally, the need component examines the need for care and services, which is usually measured by an individual's assessment or perception of care needs. Andersen (1968) specifies how the three components explain health service use. Andersen explains that the predisposing component may not be directly related to health conditions or health service use but the enabling component is necessary to explain health service use. However, most of all, the need component is indispensable to explain actual health service use (Andersen, 1968).

Andersen's model evolved over time based on critiques and input from his colleagues as well as in response to changes in health care policies and the health service delivery system (Andersen, 2008). Since its inception, Andersen (1995, 2008) has expanded his original model by incorporating contextual characteristics. The expanded model explains that contextual characteristics as well as individual characteristics have an impact on the use of health services and health outcomes (see Figure 1). Although Andersen's (2008) model added more components to the original model, the fundamental components (i.e., predisposing, enabling, and need factors) to explain health service use have not changed over time. The expanded model has been employed by several studies that incorporated contextual characteristics including neighborhood characteristics and health care related variables into Andersen's model to explain mental health service utilization (e.g., Dobalian & Rivers, 2008; Hochhausen, Le, & Perry, 2011; Kim et al., 2013).

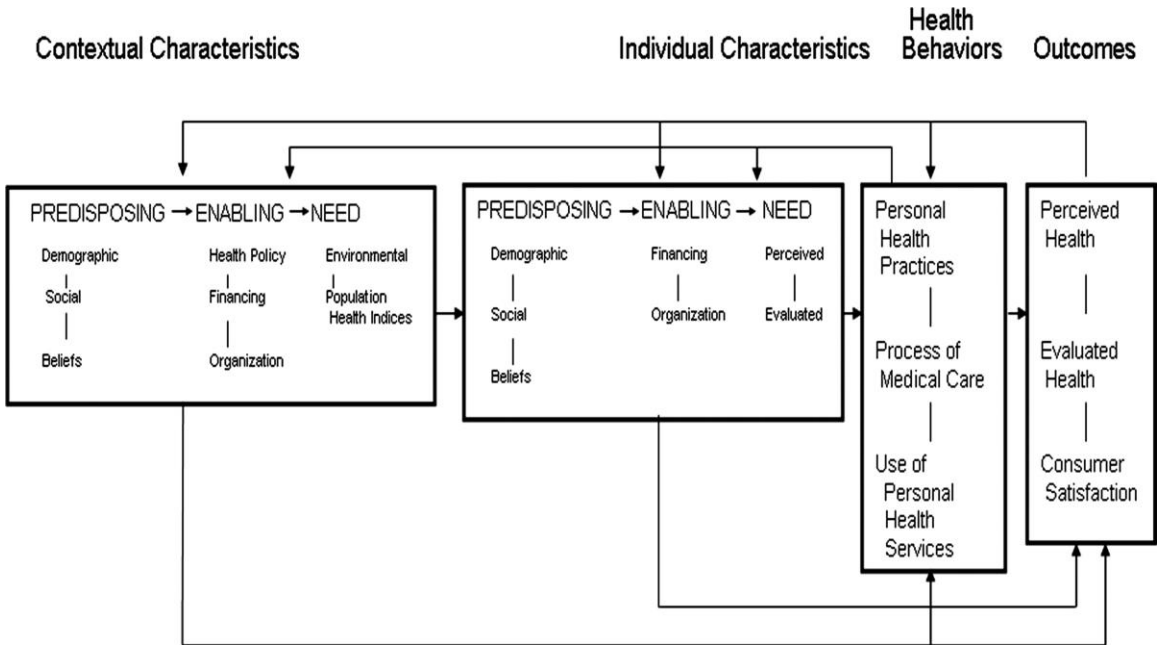

Figure 1. A behavioral model of health services use including contextual and individual characteristics

Reprinted from "National health survey and the behavioral model of health services use", by R. M. Andersen, 2008, *Medical Care*, 46(7), p. 651. Copyright 2008 by Lippincott Williams & Wilkins. Reprinted with permission.

In particular, the expanded model explains that the contextual predisposing, enabling, and need characteristics are associated with the use of health services (Andersen, 2008; Andersen & Davidson, 2007). Andersen (2008) categorizes the contextual predisposing, contextual enabling, and contextual need components in the same way as he divided individual characteristics. The contextual predisposing component includes community demographic characteristics (e.g., composition of age, gender, and marital status in a community) and social characteristics (e.g., education level, ethnic composition) (Andersen & Davidson, 2007). The contextual enabling component includes health policies made in the public sector (e.g., public policies and managed care organizations), financing characteristics defined as resources available to

pay for health care services (e.g., rate of health insurance coverage, per capita community income, and wealth), and organization (e.g., supply of health care services in the community). The contextual need component includes health-related physical environment (e.g., quality housing, water) and population health indices (e.g., mortality, morbidity, and disability rate) (Andersen, 2008; Andersen & Davidson, 2007).

Andersen's (2008) expanded model is useful to answer this study's research questions regarding mental health service utilization because it incorporates contextual factors to explain health service use as a specific outcome. The model is comprehensive, embracing a sociological perspective as well as biomedical and cognitive perspectives to explain the use of health services. Thus, Andersen's expanded model adequately addresses the importance of county context as well as individual factors to understand mental health service utilization among older racial and ethnic minorities.

Search Strategy

To search for literature that reviewed the relationship between contextual characteristics and mental health services utilization, I utilized electronic searches to identify relevant literature for this dissertation after identifying applicable databases and search terms in February 2017. Electronic literature searches were conducted using EBSCO Databases. In EBSCO Databases, Abstracts in Social Gerontology, Academic Search Premier, AgeLine, CINAHL with Full Text, MEDLINE, Psychology and Behavioral Sciences Collection, PsycINFO, Race Relations, Social Work Abstracts, SocINDEX with Full Text, and Urban Studies Abstracts were used to search for terms related to the topic. Search terms included "mental health" or "mental health service"; and "use," "utilization," "access," or "help-seeking"; "neighborhood," "community,"

"context*," "census block," "census tract," "multilevel," "region*," or "geograph*"; "old*," "elderly," "geriatric," "aged," or "senior"; and "racial and ethnic group," "Asian," "Hispanic/Latino," or "Black/African American" with Boolean operators. Dates searched were not restricted in order to identify all studies that examined a relationship between county context and mental health service utilization. Most studies that I found included older adults in the study sample but not exclusively, and they reported findings for the sample as a whole only.

Contextual Characteristics and Mental Health Services Utilization

A limited number of studies have examined the role of contextual variables in explaining mental health service utilization among older racial and ethnic minorities. I reviewed 11 studies that examined the relationships between contextual variables and mental health service utilization of racial and ethnic minorities: Three studies used older adults as the samples and the other eight studies included older adults in the study samples, but not exclusively. I present their findings below, organized by categories derived from Andersen's (2008) Behavioral Model of Health Services Utilization. Studies that do not examine the roles of neighborhood or community context were excluded in this section.

Predisposing characteristics. Where people live can be important to understanding their mental health service utilization (Andersen & Davidson, 2007). The studies that reviewed socio-demographic composition in a community and geographic areas to understand mental health service utilization are presented here.

Geographic regions/areas. Studies that explored the relationships between geographic regions and mental health services utilization showed mixed findings. Using

the 1999-2002 California Department of Mental Health-Client and Service Information system, one study found that older adults in Southern (OR: 0.85) and Coastal (OR: 0.69) California were less likely to visit county mental health services centers, compared to those in Central California (Kaskie, Gilder, & Gregory, 2008). However, in a national study employing the 2001-2003 Collaborative Psychiatric Epidemiology Surveys, Kim et al. (2013) reported that geographic regions (Midwest, Northeast, South, and West) were not significant in explaining the use of mental health services among older Blacks and older Whites. When Kim and colleagues (2013) conducted additional analyses by each geographic region, they found that older Whites in the South (OR: 2.08) were more likely to use mental health services compared to older Blacks in the South, but there were no differences in the other three geographic regions. The difference in findings may be because the two studies used different geographic regions as variables (regions in California versus the U.S.).

Other studies found that people living in a metropolitan area were more likely to use mental health services compared to those living in a non-metropolitan area. Using Medicare claims and survey data between 1992 and 1999, a higher rate of use of psychotherapy for depression was found among older adults living in metropolitan areas (30.2%) than among those living in non-metropolitan areas (12.6%) (Wei, Sambamoorthi, Olfson, Walkup, & Crystal, 2005). In a study using the 1998-1999 Community Tracking Study, Dobalian and Rivers (2008) found that adults living in a nonmetropolitan area (OR: 0.76) were less likely to have visited a mental health professional during the past 12 months, compared to those living in a large metropolitan area. Similarly, White respondents living in a nonmetropolitan area (OR: 0.78) were less

likely that those living in a large metropolitan area to have visited a mental health professional, but no significant relationship was found in African Americans and Hispanic groups (Dobalian & Rivers, 2008). Similarly, in a national study using the 2001-2003 Collaborative Psychiatric Epidemiology Surveys, people living in areas with populations less than one million (OR: 0.59) were less likely to use specialty mental health services compared to those living in areas with populations over one million (Cook et al., 2013). However, another study found that population density had no relationship with the number of outpatient mental health visits of Medicaid recipients (Wanchek, McGarvey, Leon-Verdin, & Bonnie, 2011). Although there are differences in study samples and methodologies, overall, people living in a metropolitan area are more likely to use mental health services compared to those living in a nonmetropolitan area.

Social characteristics. Neighborhood and community demographic composition may be associated with mental health services utilization (Dinwiddie et al., 2013). However, the percentage of Black, Hispanic, and Asian adults in communities had no relationship with outpatient specialty mental health service use among adults in general in the past 12 months (Cook et al., 2013). In addition, other neighborhood characteristics, including the percentage of residents with a high school diploma and drug sale arrest density, were not associated with initial outpatient treatment attendance (Stahler et al., 2009).

Enabling characteristics. The studies that examined the relationships between mental health services utilization and the supply of providers and health care policy are presented here.

Supply of Providers. Existence of community mental health centers in a county was an important enabling characteristic for mental health services utilization in the previous literature. Two studies (Cook et al., 2013; Wei et al., 2005) found increased access to mental health services for those in counties with community mental health centers[3]. In a study using the 1992-1999 Medicare Current Beneficiary Surveys, older adults living in a county with a mental health center were more likely to use psychotherapy for depression than those living in a county without a mental health center (OR: 1.50) (Wei et al., 2005). In a study using the 2001-2003 Collaborative Psychiatric Epidemiology Studies (CPES), Latinos (OR: 2.69) and African Americans (OR: 3.32) living in a county with a community mental health center were more likely to have used any mental health services during the past 12 months compared to those living in a county without a community mental health center (Cook et al., 2013). This may be because community mental health centers are effectively reaching African Americans and Latinos (Cook et al., 2013). However, the existence of a community mental health center was not associated with any differences between Asians and Whites in using any mental health services (Cook et al., 2013). Although Asians are more likely to be uninsured than Whites, they think differently about mental health problems and may not value individual mental health therapy (Cook et al., 2013). Sample differences may explain the different effect sizes found in the two studies; Wei and colleagues (2005) used a Medicare sample, whereas Cook et al. (2013) included all adults in the sample.

[3] Community mental health centers must provide outpatient mental health services, 24-hour emergency care services, day treatment, and screening for patients who can be admitted to State mental health facilities (HRSA, 2014).

In addition to the existence of community mental health centers, the existence of mental health specialists in a county appears to be related to greater use of mental health services. If older adults live in counties with psychiatrists to provide psychotherapy, they are more likely to receive psychotherapy treatments than those living in a county without a psychiatrist (OR: 2.19) (Wei et al., 2005). Considering racial and ethnic groups, there were mixed findings. African Americans living in a county with a greater number of specialty mental health providers per 10,000 residents were more likely to use any formal mental health services in the past year compared to those living in a county with a lower number of specialty mental health providers (OR: 1.03) (Cook et al., 2013), although the effect size was very small. For Asians and Latinos, the density of specialty mental health providers was not associated with the use of mental health services (Cook et al., 2013). The reason why differences among racial and ethnic groups exist is not clear because there was no information on a proportion of mental health professionals from diverse racial and ethnic groups.

Distance to local mental health service providers may encourage or discourage people from using mental health services. Two studies found that distance or travel time to health care facilities[4] were associated with mental health service use (Dobalian & Rivers, 2008; Stahler et al., 2009), but the results were different. Persons living in an area far from a hospital were less likely to attend an initial mental health appointment (OR: 0.31) (Stahler et al., 2009). However, Dobalian and Rivers (2008) found that people living in areas within 21-30 minutes' travel time to a local health facility (OR: 1.32) were

[4] It is not clear whether a local health facility would provide mental health services or not.

more likely to visit a mental health professional compared to those living in areas within 10 minutes. Considering racial and ethnic groups, Whites living at a distance of 11-20 minutes (OR: 1.13) and 21-30 minutes (OR: 1.44) to a local health facility were more likely to visit a mental health professional compared to those living at a distance of less than 10 minutes (Dobalian & Rivers, 2008). However, travel time was not associated with visiting a mental health professional among African Americans and Hispanic populations (Dobalian & Rivers, 2008). The results of the two studies are difficult to compare, because Dobalian and Rivers (2008) used travel time to an existing local health facility as a variable, whereas Stahler et al (2009) used actual distance to a hospital.

Health care delivery system. Medicare provides mental health services such as diagnosis and treatment of mental health conditions of older adults (Center for Medicare & Medicaid, [CMS], 2014a). In particular, Medicare Part B covers outpatient mental health services such as depression screening every year, medication management, and a yearly wellness visit, and Medicare Part D covers prescription drugs to treat mental health conditions (CMS, 2014a). However, Medicare may not cover all expense for people who require a lot of health care, and people may choose to purchase a Medicare Advantage (MA) Plan to lower their health care costs (Medicare Rights Center, 2015). MA provides all Part A and Part B benefits as well as Part D coverage as one package. It includes "Health Maintenance Organizations (HMOs), Preferred Provider Organizations (PPOs), Private Fee-for-Service Plans, Special Needs Plans, and Medicare Medical Savings Account Plans" (CMS, 2014a, p. 22). The majority of MA plans are HMOs (64%), followed by local PPOs (23%) and other plans (Kaiser Family Foundation, 2014). MA often requires patients to see primary care physicians to receive treatment, which

may increase or decrease the likelihood of a referral to mental health care depending on primary care physicians' recognition of mental health needs. Although the number of MA enrollees has increased from 5.3 million in 2004 to 15.7 million in 2014 (Kaiser Family Foundation, 2014), little research has examined the relationship between mental health services use and proportion of MA enrollees in counties.

Medicaid also provides mental health services to older adults with limited financial resources. Medicaid coverage for mental health services include but are not limited to counseling, therapy, social work services, peer supports, medication management, and substance use treatment (U.S. Department of Health and Human Services [DHHS], n.d.). In a study conducted with mental health service users in 49 county mental health departments in California, older adults living in a county with a higher proportion of Medicaid beneficiaries were less likely to visit county mental health centers compared with those living in a county with a lower proportion of Medicaid beneficiaries (Kaskie et al., 2008). In another study using the 2001-2002 Health Care for Communities study, there was no difference in any mental health service utilization between Medicaid beneficiaries and adults with private insurance (Stockdale et al., 2007).

HMOs may increase mental health services use of adults in general (Cook et al., 2013), and a higher portion of HMOs in insurance markets has a relationship with increased use of specialty mental health care (Stockdale, Tang, Zhang, Belin, & Wells, 2007). In particular, African Americans living in a county with a greater proportion of HMO market share were more likely to use any mental health services in the past 12 months (OR: 15.80, but no information on a confidence interval), compared to Whites (Cook et al., 2013). The huge effect size found in this study might be because an increase

in HMO penetration helps African Americans have a usual source of care, but it is not known whether the difference results from the types of insurance that are available (Cook et al., 2013). There were no significant relationships between HMO penetration and mental health services use among Latinos and Asians (Cook et al., 2013), and the authors could not account for the differences in findings.

In a managed care system, an insurance company may implement a gatekeeper system requiring a referral for mental health service (Ojeda & McGuire, 2006). In a study using the 1997-1998 Health Care for Communities Survey, Ojeda and McGuire (2006) found that insured people who had a gatekeeper system requiring an additional sign-up or referral to get a specific mental health service were less likely to use any mental health services in the managed care system than those without a gatekeeper (OR: 0.65). Thus, the mental health care setting can drive mental health service utilization (Ojeda & McGuire, 2006).

People who are uninsured may pay for mental health services out of pocket if charity care for the uninsured is not available in their communities (Stockdale et al., 2007). A community with a higher proportion of uninsured may limit mental health services utilization depending on the communities' budget, resulting in lower use of mental health services. In a study using the 2000-2001 Health Care for Communities study, Stockdale and colleagues (2007) found that a higher proportion of uninsured individuals at the county level was associated with lower levels of any mental health services use (OR: 0.99) (Stockdale et al., 2007).

Socioeconomic status. Two studies that examined the relationship between community income and mental health service utilization yielded mixed findings. In a

study using Virginia's Medicaid claims files between 2005 and 2008, Wanchek et al. (2011) reported that Medicaid recipients with serious mental illness living in a county with higher income[5] (OR: 0.99) were less likely to visit outpatient community mental health centers compared to those living in a lower income area. However, the effect size was small, and these findings may be explained by the large sample size (N = 11,107). The study might have sufficient power to detect differences that are statistically significant, but the small difference may not be practically significant. In another study using the 1995 New York State Office of Mental Health Patient Characteristic Survey,[6] Chow et al. (2003) examined the relationships between poverty areas and racial and ethnic groups using New York City zip-code-level data. Among mental health patients living in low-poverty areas (i.e., less than 20% households are in poverty), Whites (75.3%) were more likely to use outpatient public mental health services in New York compared to Blacks (59.9%), Hispanics (72.6%), and Asians (72.8%). It is important to note, however, that the differences between Whites, Hispanics, and Asians identified in this study might not be practically meaningful because the study sample was very large (N = 78,085) and the differences are small. In contrast, Hispanics (84.7%) and Asians (78.7%) were more likely to use mental health services than Whites (74.5%) among the mental health patients living in high-poverty areas (Chow et al., 2003). The findings in these two studies suggest that neighborhood and community income may affect mental

[5] It is not clear whether community income was measured in dollars or another unit (e.g., $1,000).
[6] The survey was conducted with clients who received a variety of services from state mental health care facilities.

health services utilization among older racial and ethnic minorities, although the use of different samples and locations makes it difficult to compare findings across studies.

Stahler and colleagues (2009) examined a variety of neighborhood characteristics (using exact address information) to explain whether a person attended their initial outpatient mental health appointment after discharge from a hospital. In particular, socioeconomic disadvantage of a neighborhood may affect patient outcomes such as going to their outpatient appointment (Stahler et al., 2009). They found that people living in census blocks with high rates of vacant housing were less likely to attend the initial outpatient appointment, compared to those in areas with lower rates of vacant housing (Stahler et al., 2009).

Based on the review of previous literature, county context (county-level predisposing and enabling characteristics) may play an important role in explaining mental health service utilization among older racial and ethnic minorities. However, inconsistencies in findings should be noted although there were differences in study samples and methodologies. In addition, the difference in findings may be because studies used different geographic regions. Finally, to my knowledge, there was no study that examined county-level need.

Individual Characteristics and Mental Health Services Utilization

There has been extensive research that examined the relationships between individual characteristics and mental health services utilization (Kim et al., 2013). In a systematic review of 16 studies using Andersen's model to examine the use of health services between 1998 and 2011, Babitsch and colleagues (2012) found that people's predisposing (e.g., age, race and ethnicity, length of time an immigrant, education,

marital status), enabling (e.g., household income, health insurance), and need characteristics (self-rated health and mental health status) were associated with the use of mental health services. Thus, it is important to control for individual characteristics associated with mental health services utilization when examining the role of county context.

Predisposing characteristics. More detailed information on individual characteristics that showed significant relationships with mental health services utilization are presented here. For example, Medicare beneficiaries ages 75 and over (OR: 0.68) were less likely to use psychotherapy for their depression treatment compared to those ages 65-74 (Wei et al., 2005), and increasing age was associated with lower odds of mental health services use among older Latinos (Kim et al., 2010). Gender was also significantly associated with the use of mental health services, but the findings were mixed. Older women (OR: 2.69) were more likely to use mental health services compared to older men, and Latinas were more likely to use mental health services compared to Latinos (Kim et al., 2010). However, Dobalian and Rivers (2008) reported that women (OR: 0.88) were less likely than men to visit mental health professionals in the last 12 months. These mixed findings may result from different sampling approaches and methodologies. In regard to marital status, two studies with Medicare beneficiaries and community-dwelling older adults reported that there was no difference between married older adults and unmarried older adults or older adults living alone (Kim et al., 2013; Wei et al., 2005). In relation to immigration status, U.S.-born Asian Americans were more likely to use mental health services compared with Asian immigrants (Abe-Kim et al., 2007).

Racial and ethnic disparities in mental health services use have been well documented. In a review of literature, Aranda (2016) reports that older Latinos are less likely to use mental health services compared to non-Hispanic Whites. In a study using the Medicare Current Beneficiary Survey, older African Americans (OR: 0.45) and non-Hispanic other (e.g., Asian and Pacific Islander) (OR: 0.16) were less likely to receive depression treatment among Medicare enrollees, compared to non-Hispanic Whites (Akincigil et al., 2012). Another study using the Collaborative Psychiatric Epidemiology Surveys also reported that older Whites (OR: 1.92) are more likely to use a mental health service than older Blacks (Kim et al., 2013). Blacks and Hispanics were less likely to use mental health services compared with their White counterparts, holding all other variables constant (Nadeem, Lange, & Mirange, 2008; Padgett, Patrick, Burns, & Schlesinger, 1994). In a study using the 2007 California Health Interview Survey, older Asians were less likely to see a primary care physician or a mental health care professional for their mental health needs than non-Hispanic Whites (Sorkin, Nguyen, & Ngo-Metzger, 2011).

Education was also a significant predictor of mental health services use. Older adults who graduated from college (OR: 2.72) were more likely to attend psychotherapy for their depression compared to those without a college degree (Wei et al., 2005). Another study also found that older adults with a college degree (OR: 2.11) were more likely to receive mental health services compared to those without a high school diploma (Kim et al., 2013).

Enabling characteristics. As might be expected, having insurance coverage encourages people to use mental health services. Those with Medicare (OR: 2.70) were

more likely to visit mental health professionals compared to non-insured people (Dobalian & Rivers, 2008), and people who had public health insurance (OR: 2.12) were more than twice as likely to use mental health services compared to those without health insurance (Cook et al., 2013).

Need characteristics. In a review of literature, older Hispanics with more severe mental health symptoms or with perceived mental health needs were more likely to use mental health services compared to older Hispanics with less severe symptoms or without perceived needs (Guzman, Woods-Giscombe, & Beeber, 2015). In addition, for older Asian immigrants, having any mood disorder and poor self-rated mental health was related to increased mental health service use (Kim et al. 2010). As expected, for older African Americans, having any mental disorders was related to increased mental health professional visits during the past 12 months (Neighbors et al., 2008).

Gaps in the Literature

The review of previous literature suggests that county context may play important roles in explaining mental health service utilization among older racial and ethnic minorities, but this literature has notable limitations. First, a limited number of studies have used county as the unit of analysis in explaining mental health service utilization among older racial and ethnic minorities (e.g., Cook et al., 2013; Wei et al., 2005). The geographic boundaries that have been used in previous studies have varied and include the U.S. regions of Midwest, Northeast, South, and West (Kim et al., 2013), states (Kim et al., 2013), counties (Cook et al., 2013; Stockdale et al., 2007; Wei, 2005), Census tracts (Stockdale et al., 2007), zip codes (Dinwiddie et al., 2013), and exact address

information (Stahler et al., 2009). Due to use of different units of analysis in the previous studies, it may be difficult to compare the findings.

Second, the previous studies have not comprehensively examined the role of county context to explain mental health service utilization. Some studies have examined geographic variations in understanding the use of mental health services among older racial ethnic minorities (Kaskie et al., 2008; Kim et al., 2013), whereas other studies have identified the roles of neighborhood characteristics (e.g., distance to a local health facility or per capita income in a region) to understand mental health services utilization (Dobalian & Rivers, 2008; Wanchek et al., 2011). Cook and colleagues (2013) describe their study as one of the few to examine the role of geographic differences by mental health provider supply in racial and ethnic disparities in mental health service utilization with a nationally representative sample. Unlike these previous studies that focus only on a few contextual variables, the present study explores mental health service utilization within a more comprehensive county context.

Third, only a limited number of studies has focused on older adults as their study population (e.g., Kaskie et al., 2008; Kim et al., 2013; Wei et al., 2005). All studies reviewed above included older adults in the study sample but not exclusively. Kaskie and colleagues (2008) studied mental health service use among older Californians and Wei and colleagues (2005) examined the use of psychotherapy of Medicare beneficiaries, but Kim and colleagues (2013) were the first to examine geographic variation of older Whites and Blacks in mental health service use. Understanding mental health service use exclusively among older adults is important because older adults may be more likely to face physical health challenges than younger adults, and older adults' experiences of

mental health symptoms, diagnoses, and treatments differ from those of younger adults (Garrido, Kane, Kaas, & Kane, 2011). For example, different from younger adults, about two-thirds of older adults with a mental health symptom did not receive a mental health service (Garrido et al., 2011). Older adults are more likely to receive mental health treatment from a primary care physician, whereas younger adults seek treatment from the mental health care sector (Petterson, Miller, Payne-Murphy, & Phillips Jr, 2014).

Lastly, to my knowledge, previous studies have not looked at how differently county contexts affect mental health service utilization of older Hispanics, Blacks, and Asians. Whereas Whites can be an important reference point to understand racial disparities in services use, it is also important to examine mental health service utilization of older Hispanics, Blacks, and Asians separately, because the three groups are heterogeneous in their cultural background, immigration history, and socioeconomic status (Alvarez et al., 2014; Chadiha, Rozario, Aranda, & Fielding, 2016; Sorkin et al., 2011). This study focuses on understanding the role of contextual characteristics applicable to older Hispanics, Blacks, and Asians rather than examining differences between Whites and other racial and ethnic groups, because understanding the sources of heterogeneity within each group is also important in mental health service research (Rozario & DeRienzis, 2008).

Conceptual Framework and Research Questions

Based on Andersen's model and previous empirical studies, Figure 2 presents the conceptual framework for this study, including the constructs and hypothesized relations among county context, individual characteristics, and mental health services utilization. This study focuses on what characteristics of county context are associated with mental

health service utilization of older racial and ethnic minorities, and whether there are differences in county context that explain mental health services utilization among those populations.

The research questions are as follows:

Research question 1: What county contexts (i.e., county predisposing, enabling, and need factors) are associated with mental health service use among older Hispanics, controlling for individual characteristics?

Research question 2: What county contexts (i.e., county predisposing, enabling, and need factors) are associated with mental health service use among older Blacks, controlling for individual characteristics?

Research question 3: What county contexts (i.e., county predisposing, enabling, and need factors) are associated with mental health service use among older Asian Americans, controlling for individual characteristics?

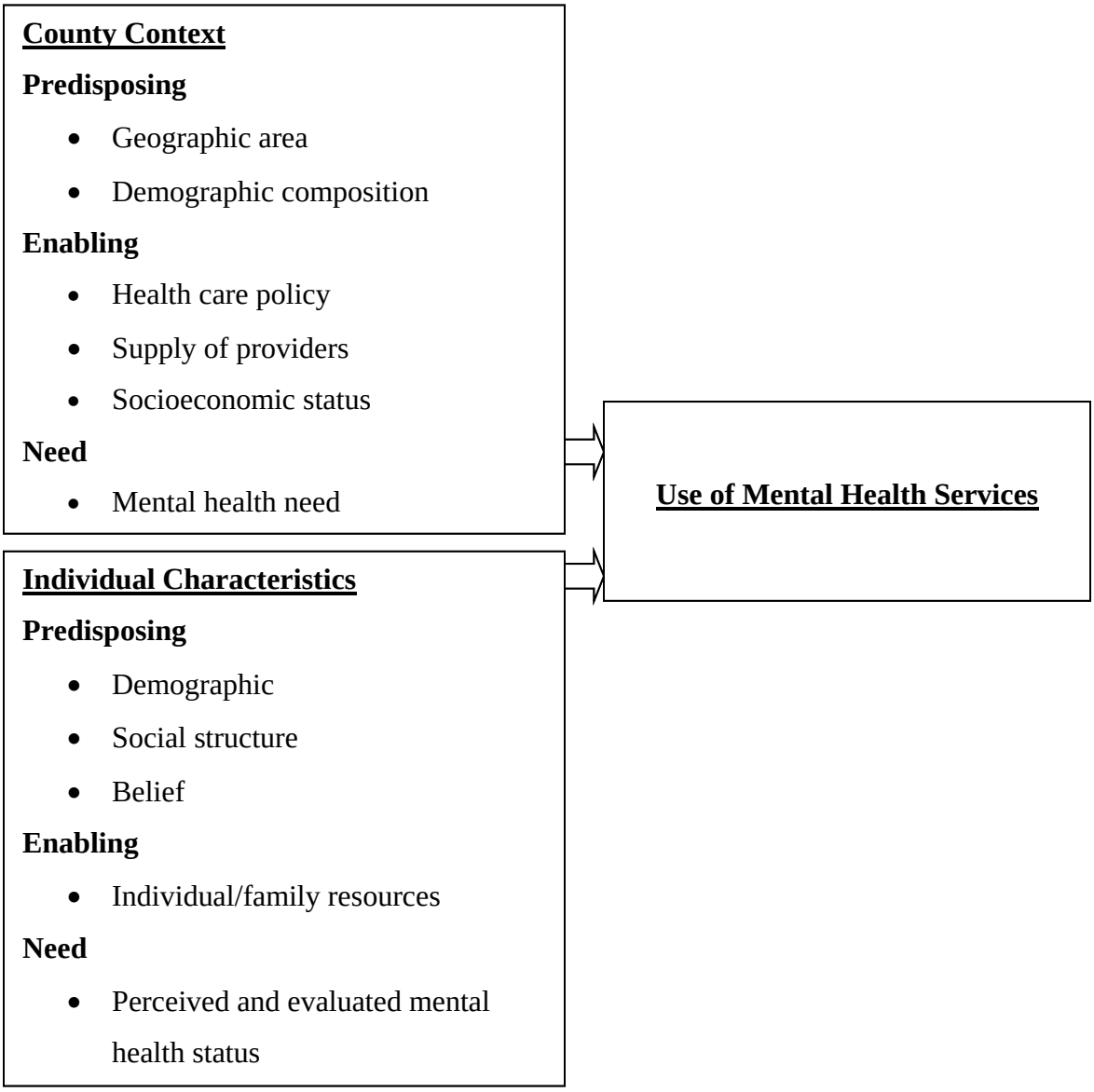

Figure 2. Conceptual Framework of the Study

CHAPTER 3: METHOD

This study employs a prospective design to examine the role of county contexts in mental health services utilization of older racial and ethnic minorities (i.e., Hispanics, Blacks, and Asian Americans) using a secondary data analysis of the 2008-2012 Medical Expenditure Panel Survey (MEPS) and linked county-level data from the 2013-2014 Area Health Resources Files (AHRF) and the 2008-2012 Chronic Conditions Data Warehouse (CCW). This chapter presents detailed information on the data sources, sample characteristics, measures, and data analysis plans of the study.

Data Sources

2008-2012 Medical Expenditure Panel Survey (MEPS). The MEPS is a national survey to estimate health care use and health services expenditures, payment sources, health care insurance coverage, and access to health care and quality for the U.S. civilian noninstitutionalized population; it has collected data annually from about 15,000 households[7] since 1996 (AHRQ, 2013). The MEPS calls each new sample a panel, and collects data for two consecutive calendar years using five rounds of interviews from each panel (see Figure 3). The MEPS consists of three survey components: household, medical provider, and insurance. The household component data are collected via self-report, and they provide information on health care expenditures and sources of payment, households' demographic and socioeconomic status, employment, and medication and health service uses (AHRQ, 2013). The medical provider component data are obtained from the survey of medical providers because household respondents may not provide

[7] Typically, one respondent provides information on all household members, so annual sample size is more than 30,000 persons (e.g., N = 31,228 for 2010).

accurate information on dates of visits, diagnosis, and payment (AHRQ, 2013). In addition, the insurance component provides information on health insurance programs obtained from annual surveys of both private and public sector employers (AHRQ, 2013).

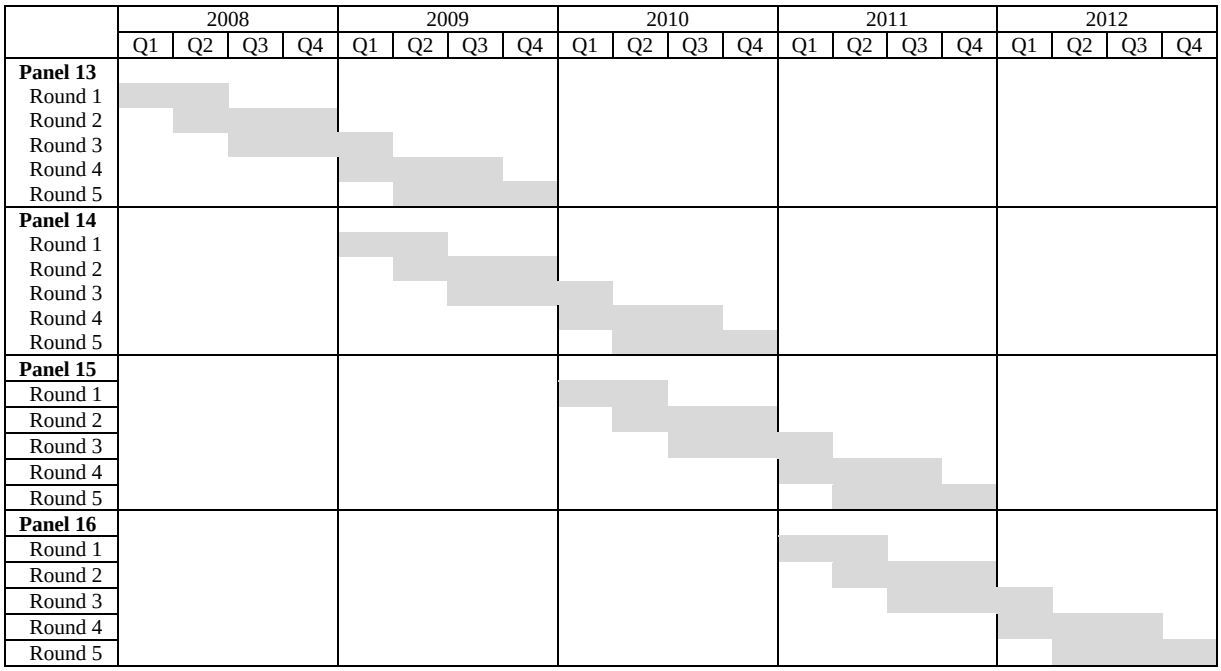

Figure 3. MEPS Design: Data Reference Period

Each year, the MEPS selects a new sample of households from among those households participating in the previous year's National Health Interview Survey (NHIS) sponsored by the National Center for Health Statistics (AHRQ, 2010b). Using a complex stratified multi-stage probability design, the NHIS collects data from a total of 428 primary sampling units (Parsons et al., 2014), and the MEPS uses roughly half of the primary sampling units (Chowdhury & Mirel, 2014). Usually a sampling unit consists of a county, but sometimes two or more counties may be used as a sampling unit. The MEPS collects data on all households within each PSU selected from the NHIS. To provide more accurate estimates for subpopulations, the MEPS oversamples Asian, Black, and Latino populations in all panels (Chowdhury & Mirel, 2014). The MEPS

conducts data collection using computer-assisted personal interviews. About 99% of the sample was interviewed in English or Spanish. The interviews take an average of 90 minutes, with a range of one to four hours. The MEPS recommends properly specifying the stratum and primary sampling unit variables to reflect within-household clustering and correlations (AHRQ, n.d.).

This study employs five-year MEPS individual level data between 2008 and 2012 (panels 13-16). Five-year data are used because most county data are based on 2010 census data or on 2008-2012 averages. Combining multiyear data has been used by researchers to provide a sufficient sample size for comparisons among racial and ethnic groups (e.g., Choi, 2014; Jimenez, Cook, Bartels, & Alegría, 2013). Additionally, the MEPS consists of a variety of data files, so this study combines the Longitudinal Data Files for individual characteristics with the Hospital Outpatient Visit Files and the Office-Based Medical Provider Visits Files for information on mental health service utilization. As baseline data, this study selects the first round of interviews with each respondent who meets this study's inclusion criteria.[8]

2013-2014 Area Health Resources Files (AHRF). This study employs the county 2013-2014 AHRF to provide information on county contexts. The AHRF contains information on health resources such as health care professionals (e.g., physicians, nurses), hospitals and healthcare facilities (e.g., services, beds by type, hospital personnel), population data (e.g., demographic, employment), and environment (e.g., air quality, land area) across counties in the U.S. (https://ahrf.hrsa.gov). The AHRF annually

[8] More detailed information on the inclusion criteria for the sample is presented in the Individual Level Sample section below.

combines data from more than 50 sources such as the U.S. Census Bureau, American Medical Association, Centers for Medicare & Medicaid Services, and the National Center for Health Statistics to inform health care planning (Health Resources and Services Administration [HRSA], n.d.). The 2013-2014 AHRF provides data from 1996 to 2013 depending on data availability from the original sources. This study mostly uses 2010 information or 2008-2012 average information because individual-level data covers 2008 thru 2012.

2008-2012 Chronic Conditions Data Warehouse (CCW). This study employs the CCW database designed to reduce health care costs and to improve the quality of care (Chronic Conditions Data Warehouse [CCW], 2015). The CCW not only provides information on claims and assessment data of Medicare and Medicaid beneficiaries, but it also includes data used in the 2008-2012 chronic conditions report. In particular, the CCW provides prevalence estimates of 17 chronic conditions (e.g., Alzheimer's disease, depression, and stroke) at county and state levels. Prevalence estimates are "calculated by taking the beneficiaries with a particular condition divided by the total number of beneficiaries in our fee-for-service population, expressed as a percentage" (CMS, 2014b, p. 4). This study uses all five-year time-dependent data corresponding to individual-level data.

Merging data sources. The AHRF and the CCR include county-level data, and the MEPS includes individual-level data. For this study, the MEPS, the AHRF, and the CCR are merged by county identifiers (i.e., the Federal Information Processing Standard (FIPS) county code).

Individual Level Sample

For the study, I included people (a) who were ages 60 or older, (b) who were non-Hispanic Black/African American, non-Hispanic Asian American, or Hispanic[9], and (c) who completed the survey by themselves.

A total of 3,132 older adults were included in the study sample. Of 10,861 older adults ages 60 or older in the 2008-2012 MEPS, non-Hispanic White (*n* = 6,527) were excluded for this study. Those identifying as of multiple races (*n* = 104), non-Hispanic American Indian/Alaska Native (*n* = 54), and non-Hispanic Native Hawaiian/Pacific Islander (*n* = 37) were excluded from this study because they are not respondents of the three populations I am focusing on. Additional exclusion criteria included proxy respondents (*n* = 1,007). Table 1 presents selected sample characteristics for this study. Of the 3,132 eligible respondents, 1,872 (59.8%) were female and 1,260 (40.2%) were male. Overall, there were a higher proportion of younger respondents, with over half of the sample falling in the 60-69 age group. The majority of the sample were non-Hispanic Black, followed by Latino, and non-Hispanic Asian.

County Level Sample

The county (level two) sample sizes varied across the older Hispanics, Blacks, and Asians because this study only included counties where the sample respondents reside. The study included 156 counties for older Hispanics, 237 counties for older Blacks, and 81 counties for older Asians.

[9] People who identify as non-Hispanic White were excluded from the sample.

Table 1. *Selected Sample Characteristics (N = 3,132)*

Variable	*n* (%)
Gender	
Female	1,872 (59.77)
Male	1,260 (40.23)
Age	
60-64	1,071 (34.20)
65-69	759 (24.23)
70-74	549 (17.53)
75-79	379 (12.10)
80-84	203 (6.48)
85+	171 (5.46)
Race/ethnicity	
Hispanic	1,143 (36.49)
Black, non-Hispanic	1,567 (50.03)
Asian, non-Hispanic	422 (13.47)

Measures

Previous literature and Andersen's (2008) model guided the selection of variables utilized in this study. In this section, I describe how I operationalize mental health service use as the outcome variable, county contexts (i.e., predisposing, provider supply, and need), and individual characteristics (i.e., predisposing, enabling, and need factors).

Mental health services utilization. Mental health services utilization is defined as actual provider visits for mental health care, and the information on service use is obtained from the survey of medical providers within the MEPS. The MEPS collects data regarding dates of visits, charges, and payment. Using the Hospital Outpatient Visit Files

and the Office-Based Medical Provider Visits Files of MEPS, there are three ways of identifying mental health service use: types of providers, types of treatments, and the International Classification of Diseases, ninth revision (ICD-9) codes. If at least one of the following conditions is met, it is considered a mental health service use: (a) the person received care from a psychologist or a social worker, (b) the type of treatment received was psychotherapy or mental health counseling, or (c) a provider visit was associated with the clinical classification codes (CCC) associated with mental health conditions, during the outpatient or office-based medical provider visits. The CCC are created by aggregating the ICD-9 codes to have clinically meaningful categories, and the CCC codes of 650 through 670 refer to mental health conditions.[10] Mental health services utilization was coded as 1 = *yes* or 0 = *no*.

County context. To measure county context, demographic and socioeconomic characteristics, provider supply, and mental health service need at the county-level were used. County-level predisposing and enabling variables were obtained from the AHRF; county-level need variables were gathered from the CCW. This study also describes the original source and year for each of county variables because the AHRF draws data from multiple sources.

County predisposing characteristics. Table 2 provides information on variables, level of measurement, ranges, and original data sources. The data were obtained from the AHRF.

[10] Please see http://www.hcup-us.ahrq.gov/toolssoftware/ccs/AppendixASingleDX.txt for detailed information on Clinical Classification Software-Diagnoses.

Table 2. *County-level Predisposing Variables and Original Data Sources*

Variables	Level of measurement	Range of values	Original Data Source[a]
Population 60+	Ratio	9-56%	2010 Census
Percent Hispanic population	Ratio	2-91%	2010 Census
Percent Black population	Ratio	0-75%	2010 Census
Percent Asian population	Ratio	0-44%	2010 Census
Metropolitan areas	Nominal	0 = *non-metropolitan area*, 1 = *metropolitan area*	2013 Department of Agriculture Economic Research Service
High school diploma	Ratio	33-76%	2008-2012 American Community Survey (five-year estimate)
Unemployment	Ratio	3-28%	2008-2012 American Community Survey (five-year estimate)

Note. [a] Data source used by the AHRF.

Population 60+, from the 2010 Census, is the percentage of persons 60 years old and older among residents residing in a county.

Percent Hispanic population, from the 2010 Census, is the percentage of residents who are Latino in a county.

Percent Black population, from the 2010 Census, is the percentage of residents who are Black in a county.

Percent Asian population, from the 2010 Census, is the percentage of residents who are Asian in a county.

Metropolitan area, from the 2013 Economic Research Service by the U.S. Department of Agriculture, is determined by the total population size and the urban-size categories.[11] The two categories include 0 = *non-metropolitan*, 1 = *metropolitan counties.*

High school diploma is a percentage of persons 25+ with high school diploma, and the original data source is the 2008-2012 American Community Survey 5-Year Estimates. Educational level at the county-level may be an indicator of how supportive a community is of individuals accessing health services (Andersen & Davidson, 2007).

Unemployment is calculated as the ratio of the unemployed to persons' ages 16 years old and over (HRSA, 2014). The AHRF provides information for each year from the 2008-2012 American Community Survey, and this study uses all five-year time dependent data corresponding to individual-level data. Racial and ethnic minorities are more likely to live in counties with higher rates of unemployment (Cook et al., 2013), and it could be that county-level unemployment rates are linked to health services access.

County-level enabling characteristics. Table 3 provides information on variables, level of measurement, ranges, and original data sources. All county-level enabling characteristics were obtained from the AHRF.

[11] There are 1,167 metropolitan counties and 1,972 non-metropolitan counties according to the 2013 Rural/Urban Continuum Codes (HRSA, 2014). Metropolitan counties include counties in metropolitan areas of 1 million population or more, counties in metro areas of 250,000 – 1,000,000 population and counties in metro areas of fewer than 250,000 population; non-metropolitan counties include urban population of 20,000 or more, adjacent to a metro area, urban population of 20,000 or more, not adjacent to a metro area, urban population of 2,500-19,999, adjacent to a metro area, urban population of 2,500-19,999, not adjacent to a metro area, completely rural or less than 2,500 urban population, adjacent to a metro area, and completely rural or less than 2,500 urban population, not adjacent to a metro area (HRSA, 2014).

Table 3. *County-level Enabling Variables*

Variables	Level of measurement	Range of values	Original Data Source[a]
Community mental health center	Nominal	0 = no, 1 = yes	2010 CMS Provider of Services
Primary care practitioner shortage area	Nominal	0 = *no shortage*, 1 = *one or more parts*, 2 = *full area*	2010 Bureau of Primary Health Care
Mental health professional shortage area	Nominal	0 = *no shortage*, 1 = *one or more parts*, 2 = *full area*	2010 Bureau of Primary Health Care
Mental health professionals per 100,000	Ratio	0-306	2010 American Medical Association Physician Master File & 2009 National Center for the Analysis of Healthcare Data
Median home value ($)	Ratio	52,700-827,300	2008-2012 American Community Survey (five-year estimate)

Note. [a] Data source used by the AHRF.

Community mental health center. Community mental health centers provide outpatient services, emergency care services, day treatment, and mental health screening (HRSA, 2014). The AHRF provides actual numbers of community mental health centers

in counties, and the presence of a community mental health center in a county may play a key role in mental health services use (Cook et al., 2013; Wei et al., 2005). The number of community mental health centers in each county will be recoded as 0 = *no* and 1 = *any mental health centers* to measure the existence of a community mental health center. The AHRF obtained the data from the 2010 Provider of Services of Center for Medicare and Medicaid Services.

Primary care practitioner shortage area. HRSA designates an area as a primary care practitioner shortage area if the following conditions are met: (a) "the area has a population to full-time-equivalent primary care physician ratio of at least 3,500:1," (b) "the area has a population to full-time-equivalent primary care physician ratio of less than 3,500:1 but greater than 3,000:1 and has unusually high needs for primary care services or insufficient capacity of existing primary care providers," or (c) "primary medical care professionals in contiguous areas are overutilized, excessively distant or inaccessible to the population of the area under consideration" in 2010 (HRSA, 2014). A primary care practitioner shortage area is coded as 0 = *none of the county designated as a shortage area*, 1 = *one or more parts of the county was designated as a shortage area*, and 2 = *the whole county was designated as a shortage area.* The AHRF obtained the data from the Bureau of Primary Health Care in 2010.

Mental health professional shortage area. HRSA designates a geographic area as mental health professional shortage area when the following criteria are met in 2010: the area has (a) "population-to-core-mental-health-professional[12] ratio greater than or equal to

[12] HRSA defined mental health professionals as "psychiatrists, clinical psychologists, clinical social workers, psychiatric nurse specialists, and marriage and family therapists" (HRSA, 2014, p. 23).

6,000:1 and a population-to-psychiatrist ratio greater than or equal to 20,000:1," (b) "a population-to-core-professional ratio greater than or equal to 9,000:1," or (c) "a population-to-psychiatrist ratio greater than or equal to 30,000:1" (HRSA, 2014). Also, the area has unusually high needs for mental services, and has: (a) "population-to-core-mental-health-professional ratio greater than or equal to 4,500:1 and a population-to-psychiatrist ratio greater than or equal to 15,000:1," (b) "a population-to-core-professional ratio greater than or equal to 6,000:1," or (c) "a population-to-psychiatrist ratio greater than or equal to 20,000:1" (HRSA, 2014). Mental health professional shortage area is coded as 0 = *none of the county designated as a shortage area*, 1 = *one or more parts of the county was designated as a shortage area*, and 2 = *the whole county was designated as a shortage area.* The AHRF obtained the data from the Bureau of Primary Health Care in 2010.

Mental health professionals per 100,000. This variable is calculated using two variables from the AHRF (i.e., number of psychiatrists and number of psychologists). The AHRF obtained the data from the 2010 American Medical Association Physician Master File for number of psychiatrists and 2009 National Center for the Analysis of Healthcare Data for number of psychologists.[13]

Median home value is "in dollars for occupied housing units" (HRSA, 2014). The AHRF obtained the data from the 2008-2012 American Community Survey 5-Year Estimates and average median home values across the five years were included in the AHRF.

[13] Numbers of social workers were not available to include in the study.

County-level needs. Table 4 provides information on county-level need variables, level of measurement, ranges, and original data sources.

Mood disorder is a county-level estimate "calculated by taking the Medicare beneficiaries with mood disorder (e.g., major depression and bipolar disorder) divided by the total number of beneficiaries in our fee-for-service population, expressed as a percentage" (CMS, 2014). People living in counties with higher rates of mental health disorders may be more likely to use specialty mental health care (Cook et al., 2013). The original data source is the 2008-2012 Chronic Conditions Report derived from Chronic Conditions Data Warehouse, and this study used all five-year data corresponding to individual-level data.

Table 4. *County-level Need Variables*

Variables	Level of measurement	Range of values	Original Data Source[a]
Mood disorder	Ratio	7-28%	2008-2012 Chronic Conditions Data Warehouse

Note. [a] Data source used by the AHRF.

Individual characteristics. To measure individual characteristics suggested by Andersen's (2008) model and previous literature, this study controlled for individual predisposing, enabling, and need factors.

Individual predisposing characteristics.

Age is measured as age in years at the beginning of the first round of interviews. Age in years ranges from 60 to 85 years old because the MEPS top-coded at 85 years of

age to protect respondents' privacy (i.e., anyone age 85 or older is coded in MEPS as being 85 years of age).

Gender is coded as 0 = *male* and 1 = *female*.

Marital status refers to current marital status such as married, widowed, divorced, separated, or never married. This study recodes marital status as 0 = *unmarried* and 1 = *married.*

High school diploma is coded as 0 = *no* and 1 = *yes*.

Foreign born. Whether a person was born in a foreign country is coded as 0 = *no* and 1 = *yes*.

Language spoken most in home is coded as 0 = *English*, and 1 = *other language*.

Attitudes toward health care. The MEPS includes four questions to measure attitudes toward health care, which are the same questions used in the 1987 National Medical Expenditure Survey. Two questions measure attitudes toward health insurance: "Do not need health insurance" and "Health insurance is not worth the money it costs" (AHRQ, 2013). Two questions measure attitudes toward health service use: "More likely to take risks than the average person" and "Can overcome illness without help from a medically trained person" (AHRQ, 2013). The four items are measured by a five-point Likert scale (1 = *strongly disagree* through 5 = *strongly agree*), and the total scores range from 4 to 20, with a higher score indicating more negative attitudes toward health care. Cronbach's alpha in the current sample was .90 for these four items.

Individual enabling characteristics.

Poverty status. The MEPS asks respondents their annual income using federal income tax forms at the beginning of the first round of interviews, and assigns each

person in a poverty category based on the poverty line defined by the U.S. Census Bureau. The categories are the following: 1 = *poor* (*less than 100% of poverty line*), 2 = *near poor* (*100% to less than 125%*), 3 = *low income* (*125% to less than 200%*), 4 = *middle income* (*200% to less than 400%*), and 5 = *high income* (*greater than or equal to 400%*).

Uninsured. Health insurance coverage for a person during a year is categorized into 0 = *insured* and 1 = *uninsured*. This study used all five-year data corresponding to individual-level data collection period.

Individual need characteristics.[14]

Short Form 12 Version 2 (SF-12v2). General health status and mental health status are measured by the SF-12v2. Ware and colleagues (1996) constructed the SF-12v2 using a subset of the SF-36 Health Survey and it was validated with multiple samples (Fleishman, Selim, & Kazis, 2010; Ware, Kosinski, & Keller, 1996). The SF-12v2 assesses an individual's functioning and well-being during the past 4 weeks with 12 items, and it yields two summary scores: physical component summary (PCS) and mental component summary (MCS). The SF-12v2 uses norm-based standardized scores to have means of 50 and standard deviations of 10 for the U.S. population (Ware et al., 1996). A higher score indicates better health and mental health status (Fleishman et al., 2010), but if a person's score is below 45, the person's health and mental health status is below the average range (Ware, Kosinski, Bjorner, Turner-Bowker, Gandek, & Maruish, 2007).

[14] There are significant correlations between the K6 and the SF-12 (K6 and SF-12 PCS: -.37, K6 and SF-12 MCS: -.63), but VIF statistics reported below indicated these correlations were not problematic in the analyses.

K6. Evaluated mental health status and non-specific psychological distress is measured by the K6 scale developed by Kessler and colleagues (2002). The K6 has been validated with worldwide samples (Kessler et al., 2002; Kessler et al., 2010) and been widely used in mental health services research (e.g., Jimenez et al., 2013). The K6 scale assesses an individual's non-specific psychological distress, rather than their disorder-specific distress during the past 30 days. The K6 scale can discriminate cases of DSM-IV disorders and non-cases, so it is widely used in national health surveys (Kessler et al, 2002). The K6 consists of six items asking, "During the last 30 days, about how often did you feel nervous, feel hopeless, feel restless or fidgety, feel so sad that nothing could cheer the person up, feel that everything was an effort, feel worthless?" It uses a five-point Likert scale (0 = *none of the time,* 1 = *a little of the time,* 2 = *some of the time,* 3 = *most of the time,* and 4 = *all of the time),* and the total scores range from 0 to 24, with a higher score indicating a higher level of mental distress.

Data Analysis

Weighting. This study focuses on examining whether county contexts are associated with mental health service use among older racial and ethnic minorities, controlling for individual characteristics. The MEPS uses a complex survey design, so all bivariate and multivariate analyses employed sampling weights and variance estimation variables. In particular, the analysis of the MEPS requires the use of the Taylor series linearization method to provide accurate estimation of the variance structure and standard errors, and the strata and the PSU need to be specified (AHRQ, 2013).

Restricted data use. This study involves the use of restricted data (i.e., FIPS codes), so a proposal was submitted to and approved by the Agency for Healthcare

Research and Quality (AHRQ) as well as the University of Maryland, Baltimore Institutional Review Board. Data analyses using the restricted data were conducted at the AHRQ Data Center in Rockville, Maryland.

Preliminary analyses and data cleaning. To prepare the data, descriptive statistics of both individual characteristics and county contexts were conducted using Stata 14 (StataCorp, 2015). Categorical variables such as gender and race/ethnicity were described by *n* and %. Continuous variables such as age and median income were examined by mean, standard deviation, minimum and maximum value, and range as well as skewness and kurtosis. At this stage, I examined potential coding errors, outliers, and missing data. All individual-level continuous variables were within suggested skewness and kurtosis ranges (i.e., absolute values of skewness < 3.0 and kurtosis < 10.0) (Kline, 2011). The absolute value of skewness and kurtosis of all county-level continuous variables were below 3 and 10, respectively with the exception of the number of mental health professions (kurtosis 13.97); however, data recoding was not considered because the value of kurtosis did not indicate a serious problem (Kline, 2011). Missing data were evaluated by missing value analysis, and most variables had less than 2% of missing items. However, two variables had about 5% of missing items: attitudes toward health care (5.65%) and the K6 (5.10%). Shafer (1999) recommended 5% of missing items as the cutoff, whereas Bennett (2011) indicated that 10% of missing items would be problematic. Based on these criteria, pairwise deletion for descriptive and bivariate analyses and listwise deletion for multilevel logistic regression were used. In addition, there was no multicollinearity among variables with the exception of percent of high school diplomas for older Hispanics, indicating that there might be a high correlation

with variables.[15] The Variance Inflation Factor (VIF) ranged from 1.08 to 10.44 for Hispanics (*M* = 2.31), from 1.05 to 3.15 for Blacks (*M* = 1.64), and from 1.10 to 4.07 for Asians (*M* = 2.11).

Data analysis plan. After cleaning the data including assumption checking and addressing missing data, descriptive and multivariate analyses were conducted.

Descriptive analyses. Individual-level (predisposing, enabling, and need factors, and the outcome variable) and county-level data (county predisposing, enabling, and need) were described using univariate analyses such as frequency or mean and standard deviation. The AHRQ recommends not reporting cell sizes of 10 or less to protect participant confidentiality, and this study did not report Hispanic respondents' races with cell sizes of less than 10 (i.e., Asians, Native Hawaiian, multiple race). To examine relations between individual-level variables and the outcome variable (i.e., mental health service use), chi-square analyses (for categorical IVs) and *t*-tests (for continuous IVs) were conducted. In addition, separate logistic regression analyses using robust standard errors to handle nesting of respondents within counties were run to examine the association between county-level characteristics and mental health service utilization.

Multivariate analyses. To answer the research questions, multilevel modeling analyses were conducted with Stata 14 (StataCorp, 2015). A multilevel analysis is a statistical method to estimate county-to-county variability of mental health service utilization variables in nested data because the analyses can provide more accurate

[15] As rule of thumb, any VIF of 10 or more refers multicollinearity among variables (Cohen, Cohen, West, & Aiken, 2003). The correlation between percent high school diploma and percent Hispanics was -.75. It may be because most Hispanics do not have a high school diploma. I did not remove the variable (i.e., percent high school diploma) in the analysis because the two variables are distinct; percent high school is social characteristics while percent Hispanic is a demographic variable.

parameter estimation and standard error measurements (Bickel, 2007). Akaike Information Criteria (AIC) and Intraclass Correlation (ICC) were used to evaluate model fit.

Research question 1: What county contexts (i.e., county predisposing, enabling, and need) are associated with mental health service use among older Hispanics, controlling for individual characteristics? To examine the role of county contexts, multilevel logistic regression analyses for dichotomous mental health service use were conducted in three steps. First, the unconditional model was tested to examine county-to-county variability of mental health service utilization. This was done by calculating the unconditional intraclass correlation (ICC) (Bickel, 2007). Second, individual predisposing, enabling, and need factors (Level 1) were added to the model to examine the relationships between independent variables and mental health service use. Third, county contexts (Level 2) were added to the previous model to examine whether the county contexts are predictive of mental health service use among older Hispanics, independent of individual characteristics.

Research question 2: What county contexts (i.e., county predisposing, enabling, and need factors) are associated with mental health service use among older Blacks, controlling for individual characteristics? Multilevel logistic regression analyses for dichotomous mental health service use were conducted in three steps with the older Black sample as in the analysis for research question 1.

Research question 3: What county contexts (i.e., county predisposing, enabling, and need factors) are associated with mental health service use among older Asian Americans, controlling for individual characteristics? Multilevel logistic regression analyses for dichotomous mental health service use were conducted in three steps with the older Asian American sample as in the analysis for research question 1.

CHAPTER 4: RESULTS

This chapter presents the descriptive characteristics of individual- and county-level samples from the Medical Expenditure Panel Survey, Area Health Resources File, and Chronic Conditions Report. It also provides the results of bivariate analyses (e.g., chi-square) and the findings of multivariate analyses used to address the primary research questions. All findings are presented by groups (i.e., older Hispanics, older Blacks, and older Asians).

Characteristics of U.S. Counties

Table 5 presents the overall county descriptives for 3,148 U.S. counties in the 2013-2014 Area Health Resource Files. On average, about 22% of residents in a county were older adults, ages 60 and older. More than 8 in 10 residents were White (83%), followed by Black (9%), Hispanic (8%), and Asian (1%). Over half of county residents (57%) had high school diplomas, and about 1 in 12 (8%) of county residents was unemployed. About one-third of counties (37%) were metropolitan counties, and the average median home value was about $132,000.

The average depression prevalence rate in the U.S. counties was 14%, and only 11% of counties had a community mental health center. On average, each county had 18 mental health professionals per 100,000 county residents. More than 8 in 10 counties were partially or fully health care practitioner shortage areas; only a small number of counties had no shortage in primary care practitioners (17%) or mental health professionals (13%).

Table 5. *Characteristics of U.S. Counties (N = 3,148)*

Continuous Variables	*M (SD)*	Range
Ages 60 and over (%)	22.07 (5.12)	5.81-56.19
Proportion of White (%)	82.89 (16.85)	2.7-99.2
Proportion of Hispanic (%)	8.28 (13.19)	0-95.7
Proportion of Black (%)	8.88 (14.50)	0-85.7
Proportion of Asian (%)	1.16 (2.51)	0-43.9
High school diploma (%)	56.99 (6.72)	24.69-90.24
Unemployment (%)	8.05 (2.75)	1.54-27.8
Mental health professionals (per 100,000)	17.50 (32.94)	0-1,111.11
Median home value ($10,000)	13.19 (8.06)	1.94-94.41
Mood disorder (%)	14.00 (5.12)	1.9-27.9
Categorical Variables	*n* (%)	
Metropolitan county (yes)	1,167 (37.13)	
Community mental health center (yes)	354 (11.27)	
PCP shortage area		
None of the county	538 (17.13)	
One or more parts of the county	1,267 (40.34)	
The whole county	1,336 (42.53)	
Mental health professional shortage area		
None of the county	410 (13.05)	
One or more parts of the county	552 (17.57)	
The whole county	2,179 (69.37)	

Older Hispanic Sample

Individual-level characteristics. Table 6 presents the individual-level Hispanic sample characteristics of the estimated 2,736,013 older Hispanics (unweighted n = 1,143) for continuous and categorical variables. The Hispanic sample included all respondents

who identified as Hispanic, regardless of race. Most of them were White (96%), so there was not enough variability to include the race variable in analyses. Over half were women (55%) or married (53%); the average age of the sample was 69 years old (*SD* = 9.9).

Table 6. *Individual-level Hispanic Sample Characteristics*

Continuous Variables	Weighted *M (SD)* *N* = 2,736,013	Unweighted *M (SD)* *N = 1,143*	Unweighted Range
Age	69.28 (9.87)	68.56 (7.10)	60-85*
Attitudes toward health	1.89 (1.17)	1.90 (0.87)	1-5
SF-12 (Physical health)	42.80 (16.06)	42.58 (11.88)	11.65-63.77
SF-12 (Mental health)	49.83 (14.08)	48.81 (10.58)	13.92-70.48
K-6	4.29 (7.14)	4.68 (5.64)	0-24
Categorical Variables	**Weighted *n* (%)**	**Unweighted *n* (%)**	
Mental health service visit	168,538 (6.16)	78 (6.82)	
Gender			
Female	1,507,269 (55.09)	632 (55.29)	
Male	1,228,743 (44.91)	511 (44.71)	
Race			
White	2,618,090 (95.69)	1,091 (95.45)	
Black	50,616 (1.85)	15 (2.19)	
American Indian	29,275 (1.07)	13 (1.14)	
Married (yes)	1,453,643 (53.13)	636 (55.64)	
High school diploma (yes)	1,243,244 (45.44)	430 (37.62)	
Foreign born (yes)	1,728,339 (63.17)	778 (68.07)	
Language spoken at home			
English	1,108,085 (40.5)	383 (33.51)	
Spanish	1,627,927 (59.5)	760 (66.49)	

Table 6 Continued

Income		
Poor	583,318 (21.32)	270 (23.62)
Near poor	214,230 (7.83)	114 (9.97)
Low income	617,792 (22.58)	261 (22.83)
Middle income	833,389 (30.46)	333 (29.13)
High income	487,284 (17.81)	165 (14.44)
Uninsured (yes)	371,277 (13.57)	190 (16.62)

Note. *Everyone 85 and older was coded as 85 to maintain the confidentiality of the data.

Less than half of the Hispanic sample (45%) earned a high school diploma. Almost two-thirds were born in a foreign country (63%) and spoke Spanish at home (60%). Almost one-third (30%) were middle class in terms of income (200% to less than 400% of the poverty line), followed by low income (23%; 125% to less than 200%) and poor (21%; less than 100% of the poverty line). A smaller proportion (14%) of older Hispanics were uninsured during the previous year. The physical component summary (PCS) score was below the average range, whereas the mental component summary (MCS) was within the average range (Chum, Skosireva, Tobon, & Hwang, 2016; Ware et al., 2007). In addition, the average psychological distress score using the K6 was 4.3, which was below a cut score of 13 indicating probable serious mental illness (Kessler et al., 2010). About 6% of the Hispanic sample had had a mental health service visit during the data collection period.

County-level characteristics. Table 7 presents the continuous and categorical county-level characteristics for the 156 counties where the 1,143 older Hispanic respondents resided. In the 156 counties included in this sample, an average of 2 in 10 persons were Hispanic and an average of 19% of the county residents were older adults

ages 60 and over. About 9 in 10 (90%) of counties where the Hispanic sample resided were metropolitan counties, and the median home value was about $249,000. Over half of county residents (57%) had high school diplomas and 1 in 12 (8.3%) of county residents was unemployed.

Table 7. *County-level Characteristics (N = 156)*

Continuous Variables	*M (SD)*	Range
Ages 60 and over (%)	18.99 (6.13)	9.24-56.19
Proportion of Hispanic (%)	21.75 (16.81)	2.30-90.60
High school diploma (%)	56.68 (6.71)	33.46-76.09
Unemployment (%)	8.35 (3.27)	2.80-28.20
Mental health professionals (per 100,000)	43.63 (43.71)	0-306.08
Median home value ($10,000)	24.92 (14.95)	5.73-82.73
Mood disorder (%)	13.46 (2.87)	6.56-26.47
Categorical Variables	*n* (%)	
Metropolitan county (yes)	140 (89.74)	
Community mental health center (yes)	69 (44.23)	
PCP shortage area		
None of the county	18 (11.54)	
One or more parts of the county	78 (50.00)	
The whole county	60 (38.46)	
Mental health professional shortage area		
None of the county	22 (14.10)	
One or more parts of the county	81 (51.92)	
The whole county	53 (33.97)	

The average mood disorder rate was 13% in a county (range: 6.6% - 26.5%), and less than half of the counties (44%) had a community mental health center. On average, each county had 47 mental health professionals per 100,000 county residents. Among the

counties with the Hispanic respondents, about more than 8 in 10 counties were partially or fully health practitioner shortage areas; only a small number of counties had no shortage in primary care practitioners (12%) or mental health professionals (14%). There were some noticeable county differences between the U.S. as a whole and the counties where the Hispanic sample resided. For example, 90% of counties where the Hispanic sample resided were metropolitan counties compared to 37% in the U.S. as a whole. The existence of a community mental health center in the counties where the Hispanic sample resided (44%) also differed from that in the U.S. as a whole (11%).

Association between individual characteristics and mental health service utilization of the older Hispanics. Table 8 provides information on the associations between individual-level characteristics and mental health service utilization by *t*-tests for continuous variables and chi-square tests for categorical variables. Among 1,146 Hispanic respondents, 78 (7%) used a mental health service. Women (8%) were more likely to use mental health services than men (4%); increasing age was associated with decreased use of mental health services. Unmarried people (8%) were more likely than married people (5%) to use mental health services; high school graduates (8%) were more likely to use mental health services compared to those without a high school diploma (5%). In addition, individual mental health status had significant associations with use of mental health services. People with better mental health status were less likely to use mental health services, while higher levels of psychological distress (K-6) were associated with more use of mental health services. However, six variables did not appear to affect use of mental health services: attitudes toward health care, income, SF-12 (physical health), foreign born, language spoken at home, and being uninsured.

Table 8. *Bivariate Analyses between Individual-level Variables and Mental Health Service Utilization*

Continuous Variables	Mental Health Service Utilization			
	No (*M/SE*)	Yes (*M/SE*)	*t*	*p*
Age	69.40 (0.28)	67.41 (0.91)	2.04	.043
Attitudes toward health	1.90 (0.04)	1.77 (0.12)	1.08	.280
Income	3.15 (0.08)	3.20 (0.19)	-0.22	.827
SF-12 (Physical health)	43.06 (0.48)	38.83 (2.17)	1.94	.055
SF-12 (Mental health)	50.51 (0.40)	39.52 (1.87)	5.82	<.001
K-6	3.96 (0.03)	9.22 (0.16)	-5.62	<.001
Categorical Variables	Mental Health Service Utilization		χ^2	*p*
	No (*n*/%)	Yes (*n*/%)		
Gender (%)			51.15	.023
Female	1,386,687 (91.99)	120,582 (8.01)		
Male	1,180,822 (96.10)	106,704 (3.90)		
Married (%)			36.19	.032
Not married	1,179,780 (92.01)	102,590 (7.99)		
Married	1,388,229 (95.45)	66,868 (4.55)		
High school diploma (%)			41.13	.029
No	1,425,147 (95.47)	67,622 (4.53)		
Yes	1,140,925 (91.77)	102,319 (8.23)		
Foreign born (%)			25.52	.121
No	964,646 (95.73)	43,028 (4.27)		
Yes	1,602,689 (92.73)	125,650 (7.27)		
Language spoken at home			1.35	.714
English	1,035,395 (93.44)	72,690 (6.56)		
Spanish	1,532,042 (94.11)	95,885 (5.89)		
Uninsured (%)			9.54	.145
No	2,210,792 (93.49)	143,923 (6.51)		
Yes	356,686 (96.07)	14,591 (3.93)		

Note. Complex survey analysis weighted estimates. Weighted N = 2,736,013

Association between county-level characteristics and mental health service utilization of the older Hispanics. The bivariate analyses identified three significant associations between county-level characteristics and mental health service utilization (see Table 9). Living in a county with a higher percentage of older adults (p = .006), living in a county with a higher percentage of high school graduates (p = .026), and living in a county with a higher depression rate (p = .011) were associated with more use of mental health services.

Table 9. *Bivariate Analyses between County-level Variables and Mental Health Service Utilization*

Variables	Coef.	Robust SE	*z*	*p*
Ages 60 and over (%)	0.05	0.02	2.74	0.006
Proportion of Hispanic (%)	-0.002	0.01	-0.37	0.712
Metropolitan county (%)	0.50	0.47	1.05	0.293
High school diploma (%)	0.036	0.02	2.22	0.026
Unemployment (%)	-0.03	0.04	-0.86	0.389
Community mental health center	0.56	0.31	1.81	0.071
PCP shortage area	0.23	0.29	0.78	0.434
Mental health professional shortage area	-0.31	0.20	-1.57	0.117
Mental health professionals (per 100,000)	0.003	0.002	1.3	0.193
Median home value ($10,000)	0.01	0.01	1.55	0.120
Mood disorder (%)	0.04	0.01	2.55	0.011

Note. Bivariate robust modeling accounting for clustering.

Research question 1: What county contexts (i.e., county predisposing, enabling, and need) are associated with mental health service use among older Hispanics, controlling for individual characteristics? Table 10 presents analyses from multilevel logistic regression analyses to examine whether county-level characteristics were

associated with mental health service utilization of older Hispanics, controlling for individual characteristics. First, the unconditional model was tested to examine the county-to-county variability of mental health service utilization. The ICC was 0.156, indicating that the use of mental health services differed from county to county; that is, 15.6% of mental health service utilization of older Hispanics can be explained by county membership, indicating that employing a multilevel modeling approach was appropriate. The Akaike information criteria (AIC) was 567.302, which was used as the baseline information criterion for model fit.

Second, individual predisposing, enabling, and need factors (Level 1) were added to the unconditional model to examine the relationships between individual-level variables and mental health service use (see Table 10). In Model 1, the AIC (429.624) showed improvement in the model fit compared to the unconditional model, but adding individual-level variables did not decrease the ICC (0.156). Model 1 identified four significant individual variables associated with mental health service utilization of older Hispanics: female, high school diploma, SF-12 mental health, and K-6. Being a woman (OR = 1.93) and having a high school diploma (OR = 2.24) increased the odds of using mental health services. People with a higher SF-12 mental health score (i.e., better mental health status) were less likely to use mental health services (OR = 0.95), while higher levels of psychological distress (K-6) were related to increased odds of using mental health services (OR = 1.07). However, the variables of age, foreign born, language spoken at home, attitude toward health care, income, uninsured, and SF-12 (physical health) were not predictive of mental health service utilization. Being married was nearly

significant (p = .055), suggesting that married Hispanic residents may be less likely to use mental health services than unmarried Hispanic residents.

Table 10. *Multilevel Logistic Regression for Hispanic Mental Health Service Utilization (n = 1,146)*

Parameter	Model 1 Individual only					Model 2 Individual and County				
	OR	*SE*	*p*	CIL	CIH	OR	*SE*	*p*	CIL	CIH
Intercept	7.48	15.48	0.331	0.13	431.98	0.62	2.40	0.902	0.00	1166.62
Level 1 (individual-level)										
Age	0.96	0.02	0.113	0.92	1.01	0.96	0.02	0.102	0.92	1.01
Female	1.93	0.62	**0.041**	1.03	3.64	1.89	0.62	0.051	0.996	3.58
Married	0.55	0.17	0.055	0.30	1.01	0.61	0.19	0.116	0.32	1.13
High school diploma	2.24	0.72	**0.012**	1.19	4.20	2.17	0.71	**0.018**	1.14	4.12
Foreign born	1.54	0.61	0.280	0.70	3.36	1.53	0.64	0.305	0.68	3.47
No English spoken in home	0.65	0.25	0.249	0.31	1.36	0.65	0.25	0.26	0.30	1.38
Attitudes toward health	0.85	0.16	0.389	0.59	1.23	0.84	0.16	0.367	0.58	1.22
Income	0.91	0.10	0.399	0.73	1.13	0.90	0.10	0.367	0.73	1.13
Uninsured	0.66	0.31	0.373	0.26	1.65	0.74	0.35	0.529	0.29	1.89
SF-12 (Physical health)	0.998	0.01	0.911	0.97	1.03	0.999	0.01	0.942	0.97	1.03
SF-12 (Mental health)	0.95	0.02	**0.004**	0.91	0.98	0.95	0.02	**0.005**	0.91	0.98
K-6	1.07	0.03	**0.035**	1.004	1.14	1.07	0.03	**0.032**	1.01	1.14
Level 2 (county-level)										
Ages 60 and over						1.11	0.06	**0.048**	1.00	1.23
Proportion of Hispanic						1.01	0.02	0.700	0.98	1.03
Metropolitan county						0.69	0.64	0.678	0.11	4.26

Table 10 Continued

High school diploma					0.98	0.06	0.775	0.87	1.11
Unemployment					0.94	0.06	0.361	0.83	1.07
Community mental health center					3.42	1.60	**0.009**	1.36	8.57
PCP shortage area					1.68	0.66	0.185	0.78	3.62
Mental health professional shortage area					0.70	0.29	0.391	0.31	1.59
Mental health professionals					0.999	0.01	0.913	0.99	1.01
Median home value					1.03	0.02	0.116	0.99	1.07
Mood disorder					1.03	0.05	0.537	0.94	1.14
Random parameters	B	SE		CIL	CIH	B	SE	CIL	CIH
Residual variance	.78	.27		.40	1.53	.55	.30	.19	1.60
Model fit									
AIC			429.624				431.557		
ICC			0.156				0.083		

Notes. AIC: Akaike Information Criteria. ICC: Intraclass Correlation. The bold coding indicates a statistical significance at $p < .05$ (red colored) and shaded cells indicate a statistical significance at $p < .10$.

Third, Model 2 added 11 county-level characteristics to determine whether they were predictive of mental health service utilization among older Hispanics independent of individual characteristics. Compared to Model 1, the AIC did not show improvement (431.557) in Model 2, but adding county-level variables decreased the ICC (from 0.156 in Model 1 to 0.083 in Model 2). Model 2 identified several significant variables to explain mental health service utilization. The individual variables that were predictive of mental health service utilization in Model 1 remained significant and in the same direction in Model 2. Women were more likely to use a mental health service than men

(OR = 1.89, p = .051). Having high school diploma (OR = 2.17), and higher levels of psychological distress (OR = 1.07) increased the odds of using mental health services; those with better SF-12 mental health status (OR = 0.95) were less likely to use a mental health service.

Among the county-level characteristics, two variables were predictive of mental health service utilization of older Hispanics. The existence of a community mental health center increased the odds of using mental health services (OR = 3.42), and it had the largest odds ratio among the significant variables. In addition, living in a county with a higher proportion of older adults increased the odds of using mental health services among older Hispanics (OR = 1.11). However, the other variables— proportion of Hispanic, metropolitan county, high school diploma, unemployment rate, PCP shortage area, median home value, and county mood disorder prevalence—were not predictive of mental health service utilization of older Hispanics.

Older Black Sample

Individual-level characteristics. Table 11 presents the individual-level Black sample characteristics of the estimated 3,319,324 older Blacks (unweighted n = 1,567) for continuous and categorical variables. Over half were women (61%) and about one-third were married (38%); the average age of the sample was 69 years old (SD = 11.1). Two-thirds of the respondents (67%) had a high school diploma. Less than 1 in 10 were born in a foreign country (8%). Almost 3 in 10 (28%) were middle income, followed by high income (23%) and poor (22%). Also, 6% of older Blacks were uninsured during the previous year. The SF-12 physical health score (M = 42) was below the average for the U.S., whereas the mental health score (M = 51) was about the average for the U.S.

population (Chum et al., 2016; Ware et al., 2007). In addition, the average psychological distress score using the K6 was 3.4, which was below a cut score of 13 indicating probable serious mental illness (Kessler et al., 2010).

Table 11. *Individual-level Black Sample Characteristics*

Continuous Variables	Weighted *M (SD)* *N* = 3,319,324	Unweighted *M (SD)* *N = 1,567*	Unweighted Range
Age	69.41 (11.10)	68.56 (7.10)	60-85*
Attitudes toward health	1.70 (1.12)	1.72 (0.79)	1-5
SF-12 (Physical health)	41.67 (17.13)	41.17 (11.86)	7.31-67.04
SF-12 (Mental health)	51.39 (14.94)	50.79 (10.60)	11.94-75.95
K6	3.37 (6.29)	3.58 (4.50)	0-24
Categorical Variables	**Weighted *n* (%)**	**Unweighted *n* (%)**	
Mental health service visit	178,580 (5.38)	75 (4.79)	
Gender			
Female	2,030,762 (61.18)	1,000 (63.82)	
Male	1,288,561 (38.82)	567 (36.18)	
Married (yes)	1,253,709 (37.77)	560 (35.74)	
High school diploma (yes)	2,216,313 (66.77)	966 (61.65)	
Foreign born (yes)	263,222 (7.93)	123 (7.85)	
Income			
Poor	717,970 (21.63)	396 (25.27)	
Near poor	260,567 (7.85)	137 (8.74)	
Low income	648,928 (19.55)	317 (20.23)	
Middle income	936,713 (28.22)	444 (28.33)	
High income	755,146 (22.75)	273 (17.42)	
Uninsured (yes)	195,508 (5.89)	104 (6.64)	

Note. *Everyone 85 and older was coded as 85 to maintain the confidentiality of the data.

County-level characteristics. Table 12 presents the continuous and categorical county-level characteristics for the 237 counties where the 1,567 older Black respondents resided. Of the 237 counties included in this sample, an average of two in 10 persons were Black and an average of 19% of the county residents were older adults ages 60 and over. Almost 9 in 10 (86%) of counties where the Black sample resided were metropolitan counties, and the median home value was about $205,000. Over half of county residents (57%) had high school diplomas, and 1 in 12 (8.6%) was unemployed.

Table 12. *County-level Characteristics (N = 237)*

Continuous Variables	*M (SD)*	Range
Ages 60 and over (%)	18.76 (5.30)	9.24-56.19
Proportion of Black (%)	18.96 (15.36)	0.40-75.00
High school diploma (%)	56.84 (5.36)	39.00-76.09
Unemployment (%)	8.62 (2.77)	3.10-20.80
Mental health professionals (per 100,000)	40.38 (40.12)	0-306.08
Median home value ($10,000)	20.56 (12.54)	5.27-82.73
Mood disorder (%)	13.58 (2.83)	7.44-28.01
Categorical Variables	*n* (%)	
Metropolitan county (yes)	204 (86.08)	
Community mental health center (yes)	98 (41.35)	
PCP shortage area		
None of the county	38 (16.03)	
One or more parts of the county	123 (51.90)	
The whole county	76 (32.07)	
Mental health professional shortage area		
None of the county	42 (17.72)	
One or more parts of the county	119 (50.21)	
The whole county	76 (32.07)	

The average mood disorder rate was 13.6% in a county (range: 7.4% - 28.0%), and less than half of counties (41%) had a community mental health center. On average, each county had 40 mental health professionals per 100,000 county residents. Among the counties with the Black respondents, about 8 in 10 counties were partially or fully health practitioner shortage areas; only a small number of counties had no shortage in primary care practitioners (16%) or mental health professionals (18%). There were some noticeable county differences between the U.S. as a whole and the counties where the Black sample resided. For example, the existence of a community mental health center in the counties where the sample resided (41%) differed from that in the U.S. as a whole (11%). In addition, about 86% of counties where the Black sample resided were metropolitan counties compared to 37% in the U.S. as a whole.

Association between individual characteristics and mental health service utilization of the older Blacks. Table 13 provides information on the associations between individual-level characteristics and mental health service utilization by *t*-tests for continuous variables and chi-square tests for categorical variables. Among 1,567 Black respondents, 75 older Blacks (5%) used a mental health service. Only individual's mental health status had significant associations with mental health service utilization. Better mental health status (SF-12 Mental health) decreased the odds of using mental health services ($p = .007$), whereas higher levels of psychological distress (K6) increased the odds of mental health service utilization ($p = .004$). However, the variables of age, attitudes toward health, income, SF-12 (Physical health), gender, marital status, high school diploma, foreign born, and uninsured did not show significant associations with mental health service utilization.

Table 13. *Bivariate Analyses among Individual-level Variables and Mental Health Service Utilization (Weighted N=3,319,324)*

Continuous Variables	Mental Health Service Utilization			
	No (*M/SE*)	Yes (*M/SE*)	*t*	*p*
Age	69.44 (0.27)	68.87 (1.18)	0.48	.635
Attitudes toward health	1.70 (0.02)	1.73 (0.12)	-0.29	.773
Income	3.21 (0.05)	3.41 (0.22)	-0.94	.350
SF-12 (Physical health)	41.79 (0.40)	39.55 (1.40)	1.55	.122
SF-12 (Mental health)	51.70 (0.34)	46.01 (2.11)	2.73	.007
K6	3.25 (0.02)	5.33 (0.12)	-2.91	.004
Categorical Variables	Mental Health Service Utilization		χ^2	*p*
	No (n/%)	Yes (n/%)		
Gender (%)			6.04	.440
Female	1,911,556 (94.13)	119,206 (5.87)		
Male	1,229,287 (95.40)	59,274 (4.60)		
Married (%)			0.55	.825
Not married	1,957,583 (94.77)	108,032 (5.23)		
Married	1,183,376 (94.39)	70,333 (5.61)		
High school diploma (%)			0.35	.841
No	1,045,875 (94.82)	57,136 (5.18)		
Yes	2,094,416 (94.50)	121,897 (5.50)		
Foreign born (%)			8.12	.373
No	1,502,049 (94.41)	88,936 (5.59)		
Yes	1,677,526 (97.06)	50,813 (2.94)		
Uninsured (%)			3.43	.380
No	2,952,319 (94.51)	171,497 (5.49)		
Yes	188,626 (96.48)	6,882 (3.52)		

Note. Complex survey analysis weighted estimates. Weighted *N* = 3,319,324

Association between county-level characteristics and mental health service utilization of the older Blacks. The bivariate analyses identified only one significant association: median home value (see Table 14). Living in a county with a higher median home value was associated with more use of mental health services (p = .034). All other variables were not associated with mental health service utilization of older Blacks, although the proportion of Black residents was nearly significant (p = .061), suggesting that a higher proportion of Black residents may be related to decreased use of mental health services.

Table 14. *Bivariate Analyses among County-level Variables and Mental Health Service Utilization*

Variables	Coef.	Robust SE	*z*	*p*
Ages 60 and over (%)	0.02	0.03	-0.57	.566
Proportion of Black (%)	0.02	0.01	-1.87	.061
Metropolitan county (%)	0.02	0.31	-0.07	.946
High school diploma (%)	0.001	0.02	-0.04	.968
Unemployment (%)	0.01	0.04	-0.24	.808
Community mental health center	0.02	0.24	0.10	.920
PCP shortage area	0.22	0.18	1.23	.218
Mental health professional shortage area	0.14	0.18	0.75	.451
Mental health professionals (per 100,000)	0.002	0.001	1.50	.135
Median home value ($10,000)	0.01	0.01	2.12	.034
Mood disorder (%)	0.02	0.04	-0.43	.669

Note. Bivariate robust modeling accounting for clustering.

Research question 2: What county contexts (i.e., county predisposing, enabling, and need) are associated with mental health service use among older Blacks, controlling for individual characteristics? Table 15 presents analyses from multilevel logistic regression analyses to examine whether county-level characteristics were associated with mental health service utilization of older Blacks, controlling for individual characteristics. First, the unconditional model was tested to examine the county-to-county variability of mental health service utilization. The ICC was 0.004, indicating that only 0.04% of mental health service utilization of older Blacks can be explained by county membership. Although the ICC was very small, multilevel modeling analysis was conducted because even a small ICC may influence standard errors in regression analyses (Bickel, 2007). The AIC was 606.262, which was used as the baseline information criterion for the model fit.

Second, individual predisposing, enabling, and need factors (Level 1) were added to the unconditional model to examine the relationships between individual-level variables and mental health service use (see Table 15). In Model 1, the AIC (497.029) showed improvement in the model fit compared to the unconditional model, but adding individual-level variables increased the ICC (0.084). Model 1 identified two significant individual variables associated with mental health service utilization of older Blacks: income and SF-12 mental health. A higher level of income (OR = 1.25) increased the odds of using mental health services, whereas having better mental health status decreased the odds of mental health service utilization (OR = 0.93). However, the variables of age, female, married, high school diploma, foreign born, attitude toward

health care, uninsured, SF-12 (physical health), and the K6 were not predictive of mental health service utilization.

Table 15. *Multilevel Logistic Regression for Black Mental Health Service Utilization (n = 1,567)*

Parameter	Model 1 Individual only					Model 2 Individual and County				
	OR	*SE*	*p*	CIL	CIH	OR	*SE*	*p*	CIL	CIH
Intercept	1.90	3.65	0.74	0.04	82.76	2.51	8.17	0.778	0.00	1497.39
Level 1 (individual-level)										
Age	0.98	0.02	0.243	0.94	1.02	0.97	0.02	0.203	0.94	1.01
Female	1.60	0.49	0.123	0.88	2.93	1.70	0.52	0.087	0.93	3.11
Married	0.99	0.30	0.968	0.55	1.78	0.97	0.29	0.91	0.54	1.73
High school diploma	0.86	0.25	0.603	0.48	1.53	0.74	0.22	0.309	0.42	1.32
Foreign born	0.41	0.31	0.242	0.09	1.81	0.33	0.25	0.145	0.07	1.47
Attitudes toward health	1.25	0.21	0.188	0.90	1.74	1.24	0.21	0.21	0.89	1.73
Income	1.25	0.13	**0.034**	1.02	1.54	1.26	0.13	**0.032**	1.02	1.55
Uninsured	0.65	0.37	0.454	0.21	2.01	0.78	0.45	0.667	0.26	2.39
SF-12 (Physical health)	1.00	0.01	0.944	0.97	1.02	1.00	0.01	0.934	0.98	1.03
SF-12 (Mental health)	0.93	0.02	**0**	0.90	0.96	0.93	0.02	**0**	0.90	0.96
K-6	0.99	0.04	0.837	0.92	1.07	0.99	0.04	0.792	0.92	1.07
Level 2 (county-level)										
Ages 60 and over						0.94	0.04	0.199	0.87	1.03
Proportion of Black						0.97	0.01	**0.006**	0.95	0.99
Metropolitan county						0.42	0.23	0.118	0.14	1.25
High school diploma						1.04	0.04	0.374	0.95	1.13
Unemployment						1.02	0.05	0.734	0.92	1.13
Community mental health center						1.02	0.30	0.948	0.57	1.83
PCP shortage area						1.54	0.39	0.082	0.95	2.52
Mental health professional shortage area						0.99	0.26	0.98	0.60	1.65

Table 15 Continued

Mental health professionals					1.00	0.00	0.395	0.99 1.01
Median home value					1.02	0.02	0.183	0.99 1.05
Mood disorder					0.97	0.06	0.565	0.86 1.09
Random parameters	B	SE	CIL	CIH	B	SE	CIL	CIH
Residual variance	.78	.27	.40	1.53	.55	.30	.19	1.60
Model fit								
AIC	497.029				497.165			
ICC	0.084				1.12e-16			

Notes. AIC: Akaike Information Criteria. ICC: Intraclass Correlation. The bold coding indicates a statistical significance at $p < .05$ (red colored) and shaded cells indicate a statistical significance at $p < .10$.

Third, Model 2 added 11 county-level characteristics to determine whether they were predictive of mental health service utilization among older Blacks independently of individual characteristics. Compared to Model 1, the AIC did not show improvement (497.165), but adding county-level variables reduced the ICC from 0.084 in Model 1 to nearly zero in Model 2. Model 2 identified three significant variables to explain mental health service utilization. The individual variables that were predictive of mental health service utilization in Model 1 remained significant in Model 2. A higher level of income (OR = 1.26) increased the odds of using mental health services, whereas having better SF-12 mental health status decreased the odds of mental health service utilization (OR = 0.93). Being female was significant at $p < .10$, suggesting a possible association between being female and increased use of mental health services.

Among the county-level characteristics, only one variable was predictive of mental health service utilization of older Blacks. Living in a county with a higher proportion of Black residents decreased the odds of using mental health services (OR = 0.97). However, the variables of ages 60 and over, metropolitan county, high school

diploma, unemployment rate, community mental health center, mental health professional shortage area, median home value, and county depression prevalence were not predictive of mental health service utilization of older Blacks. PCP shortage area was significant at $p < .10$, suggesting living in a county with PCP shortage may be related to increased use of mental health services.

Older Asian Sample

Individual-level characteristics. Table 16 presents the individual-level Asian sample characteristics of the estimated 1,046,331 older Asians (unweighted $n = 422$) for continuous and categorical variables. Over half were women (58%) and about two-thirds were married (66%); the average age of the sample was 70 years old ($SD = 9.6$). Almost 8 in 10 of the respondents had a high school diploma (79%) and were born in a foreign country (78%).

Table 16. *Individual-level Asian Sample Characteristics*

Continuous Variables	Weighted *M (SD)* *N* = 1,046,331	Unweighted *M (SD)* *N = 422*	Unweighted Range
Age	69.70 (9.57)	69.52 (7.37)	60-85*
Attitudes toward health	2.00 (1.21)	1.91 (0.90)	1-5
SF-12 (Physical health)	46.08 (13.81)	45.95 (10.21)	10.35-62.09
SF-12 (Mental health)	52.01 (11.74)	52.30 (9.15)	17.64-69.48
K-6	3.00 (5.41)	2.89 (4.09)	0-24
Categorical Variables	**Weighted *n* (%)**	**Unweighted *n* (%)**	
Mental health service visit	30,030 (2.87)	14 (3.32)	
Gender			
Female	608,441 (58.15)	240 (56.87)	
Male	437,890 (41.85)	182 (43.13)	

Table 16 Continued

Married (yes)	693,613 (66.29)	285 (67.54)
High school diploma (yes)	830,578 (79.38)	339 (80.33)
Foreign born (yes)	811,325 (77.54)	314 (74.41)
Language spoken in home		
English	532,478 (50.89)	218 (51.66)
Other language	510,923 (48.83)	202 (47.87)
Income		
Poor	113,632 (10.86)	47 (11.14)
Near poor	75,440 (7.21)	23 (5.45)
Low income	175,993 (16.82)	68 (16.11)
Middle income	306,156 (29.26)	123 (29.15)
High income	375,110 (35.85)	161 (38.15)
Uninsured (yes)	58,669 (5.61)	27 (6.40)

Note. *Everyone 85 and older was coded as 85 to maintain the confidentiality of the data.

About one-third (36%) were high socioeconomic status in terms of income, followed by middle income (29%) and low income (17%). Also, 6% of older Asians were uninsured during the previous year. The physical (46) and mental health scores (52) using the SF-12 was within the average range for the U.S. population (Chum et al., 2016). In addition, the average psychological distress score using the K6 was 3.0, which was below a cut score of 13 indicating probable serious mental illness (Kessler et al., 2010).

County-level characteristics. Table 17 presents the continuous and categorical county-level characteristics for the 81 counties where the 422 older Asian respondents resided. Of the 81 counties included in this sample, on average, about 8% of county residents were Asians; on average 17% of the county residents were older adults ages 60

and over. About 94% of counties where the Asian sample resided were metropolitan counties, and the median home value was about $313,000. Over half of county residents (57%) had high school diplomas, and 1 in 12 (8.6%) of the residents was unemployed.

Table 17. *County-level Characteristics (N = 81)*

Continuous Variables	*M (SD)*	Range
Ages 60 and over (%)	17.38 (3.22)	11.03-27.54
Proportion of Asian (%)	8.34 (7.88)	0.30-43.90
High school diploma (%)	57.18 (5.60)	42.68-67.86
Unemployment (%)	8. 57 (2.67)	4.30-15.60
Mental health professionals (per 100,000)	59.68 (49.74)	3.60-306.08
Median home value ($10,000)	31.34 (17.23)	5.27-82.73
Mood disorder (%)	13.07 (3.09)	6.69-26.47
Categorical Variables	*n* (%)	
Metropolitan county (yes)	76 (93.83)	
Community mental health center (yes)	38 (46.91)	
PCP shortage area		
None of the county	8 (9.88)	
One or more parts of the county	35 (43.21)	
The whole county	38 (46.91)	
Mental health professional shortage area		
None of the county	9 (11.11)	
One or more parts of the county	46 (56.79)	
The whole county	26 (32.10)	

The average depression prevalence rate was 13% in a county (range: 6.7% - 26.5%), and about half of counties (47%) had a community mental health center. On average, a county had 60 mental health professionals per 100,000 county residents and the median home value was about $313,000. Among the counties where the Asian

respondents resided, 9 in 10 counties were partially or fully health practitioner shortage areas; only a small number of counties had no shortage in primary care practitioners (10%), or mental health professionals (11%). There were some noticeable county differences between the U.S. as a whole and the counties where the Asian sample resided. For example, the median home value of counties where the Asian sample resided were $313,000 compared to $131,000 in the U.S. as a whole. The counties where the Asians sample resided had 60 mental health professionals per 100,000 compared to 18 per 100,000 in the U.S. as a whole.

Association between individual characteristics and mental health service utilization of the older Asians. Table 18 provides information on the associations between individual-level characteristics and mental health service utilization by *t*-tests for continuous variables and chi-square tests for categorical variables. Among 422 Asian respondents, 14 older Asians (3%) used a mental health service. Those with a higher income were more likely to use a mental health service ($p = .001$). High school graduates (3%) were more likely to use mental health services compared to those without a high school diploma (1%) ($p = .047$). Individual's mental health status also had significant associations with mental health services; those with better mental health status (SF-12 mental health) were less likely to use mental health services ($p = .022$). However, the variables of age, attitudes toward health care, SF-12 physical health, K6, gender, marital status, foreign born, language spoken at home, and uninsured did not show significant associations with mental health service utilization.

Table 18. *Bivariate Analyses among Individual-level Variables and Mental Health Service Utilization (Weighted N=1,046,331)*

Continuous Variables	Mental Health Service Utilization			
	No (*M/SE*)	Yes (*M/SE*)	*t*	*p*
Age	69.66 (0.69)	70.91 (2.00)	-0.59	.554
Attitudes toward health	2.00 (0.07)	2.01 (0.21)	-0.0	.953
Income	3.71 (0.08)	4.22 (0.12)	-3.39	.001
SF-12 (Physical health)	46.05 (0.69)	47.18 (3.45)	-0.32	.746
SF-12 (Mental health)	52.19 (0.52)	45.75 (2.74)	2.33	.022
K6	2.93 (0.04)	5.17 (0.34)	-1.11	.268
Categorical Variables	Mental Health Service Utilization		χ^2	*p*
	No (n/%)	Yes (n/%)		
Gender (%)			1.94	.743
Female	592,682 (97.41)	15,759 (2.59)		
Male	423,615 (96.74)	14,275 (3.26)		
Married (%)			0.35	.874
Not married	341,890 (96.93)	10,828 (3.07)		
Married	674,400 (97.41)	19,213 (2.77)		
High school diploma (%)			20.50	.047
No	214,372 (99.36)	1,381 (0.64)		
Yes	802,837 (96.66)	27,741 (3.34)		
Foreign born (%)			18.93	.240
No	223,679 (95.18)	8,742 (4.82)		
Yes	792,421 (97.67)	18,904 (2.33)		
Language spoken in home			13.40	.437
English	512,670 (96.28)	19,808 (3.72)		
Other language	500,705 (98.00)	10,218 (2.00)		
Uninsured (%)			10.16	.429
No	961,094 (97.31)	26,568 (2.69)		
Yes	55,178 (94.05)	3,491 (5.95)		

Note. Complex survey analysis weighted estimates. Weighted N = 1,046,331

Association between county-level characteristics and mental health service utilization of the older Asians. The bivariate analyses identified only one significant association (see Table 19). Living in a county with a shortage in mental health professionals was associated with increased use of mental health services (p = .034). All other variables were not associated with mental health service utilization of older Asians, although the number of mental health professionals in a county was nearly significant (p = .068), suggesting a higher proportion of mental health professionals may be related to increased use of mental health services. The metropolitan county variable did not have enough variability, so it was omitted in the analysis.

Table 19. *Bivariate Analyses among County-level Variables and Mental Health Service Utilization*

Variables	Coef.	Robust SE	*z*	*p*
Ages 60 and over (%)	-0.03	0.09	-0.35	.727
Proportion of Asian (%)	0.02	0.01	1.18	.239
High school diploma (%)	0.09	0.08	1.17	.242
Unemployment (%)	-0.09	0.06	-1.36	.172
Community mental health center	0.27	0.51	0.52	.602
PCP shortage area	0.11	0.42	-0.27	.791
Mental health professional shortage area	0. 80	0.38	-2.12	.034
Mental health professionals (per 100,000)	0.01	0.01	1.83	.068
Median home value ($10,000)	0.003	0.02	0.15	.877
Mood disorder (%)	0.03	0.07	0.48	.634

Note. Bivariate robust modeling accounting for clustering.

Research question 3: What county contexts (i.e., county predisposing, enabling, and need) are associated with mental health service use among older Asians, controlling for individual characteristics? Table 20 presents analyses from hierarchical logistic regression analyses to examine whether county-level characteristics were associated with mental health service utilization of older Asians, controlling for individual characteristics. The unconditional model was tested to examine the county-to-county variability of mental health service utilization. However, the ICC was nearly 0 (3.02e-20), and the model did not converge due to being too complex for the sample size. Therefore, instead of a multilevel approach, hierarchical logistic regression analyses employing robust modeling were used to handle nesting of respondents within counties.

Second, Model 1 entered individual predisposing, enabling, and need factors, and it was significant ($\chi^2 = 147.58$, $p < .001$). The pseudo R^2 was .167, indicating that Model 1 explained 16.7% of the variability in mental health service utilization. Model 1 identified two significant individual variables associated with mental health service utilization of older Asians: income and SF-12 mental health. A higher level of income (OR = 1.62) increased the odds of using mental health services, whereas having better SF-12 mental health status decreased the odds of mental health service utilization (OR = 0.93). However, the variables of age, female, married, high school diploma, foreign born, attitude toward health, uninsured, SF-12 (Physical health), and K-6 were not predictive of mental health service utilization.

Table 20. *Logistic Regression for Asian Mental Health Service Utilization (n = 422)*

Parameter	Model 1					Model 2				
	OR	*SE*	*p*	CIL	CIH	OR	*SE*	*p*	CIL	CIH
Level 1 (individual-level)										
Age	1.05	0.06	0.326	0.95	1.17	1.05	0.06	0.38	0.94	1.19
Female	1.2	0.84	0.692	0.36	4.59	1.33	0.87	0.66	0.37	4.80
Married	1.21	0.83	0.778	0.32	4.60	1.62	1.45	0.593	0.28	9.38
High school diploma	1.27	1.15	0.795	0.21	7.48	1.44	1.41	0.708	0.21	9.81
Foreign born	0.81	0.47	0.723	0.26	2.54	0.89	0.59	0.861	0.24	3.25
No English spoken in home	0.33	0.25	0.141	0.07	1.45	0.23	0.20	0.094	0.04	1.28
Attitudes toward health	1.09	0.23	0.677	0.72	1.66	0.92	0.17	0.664	0.65	1.32
Income	1.62	0.40	**0.049**	1.00	2.61	1.76	0.34	**0.004**	1.20	2.58
Uninsured	2.97	3.47	0.35	0.30	29.26	4.84	6.02	0.205	0.42	55.38
SF-12 (Physical health)	1.02	0.03	0.49	0.96	1.08	1.02	0.03	0.6	0.96	1.08
SF-12 (Mental health)	0.93	0.02	**0.006**	0.89	0.98	0.92	0.02	**0.001**	0.87	0.96
K-6	1.08	0.08	0.277	0.94	1.24	1.03	0.05	0.604	0.93	1.13
Level 2 (county-level)										
Ages 60 and over						0.65	0.11	**0.011**	0.47	0.91
Proportion of Asian						1.10	0.07	0.141	0.97	1.24
High school diploma						1.14	0.09	0.099	0.98	1.33
Unemployment						0.95	0.10	0.63	0.78	1.16
Community mental health center						0.57	0.51	0.525	0.10	3.28
PCP shortage area						3.26	2.87	0.181	0.58	18.36
Mental health professional shortage area						0.65	0.41	0.492	0.19	2.25
Mental health professionals						1.02	0.01	0.083	0.10	1.04
Median home value						0.93	0.04	0.094	0.86	1.01
Mood disorder						1.18	0.20	0.54	0.78	1.59
Constant	0.00	0.004	0.187	2.47E-08	30.67	0.00	0.00	0.099	6.91E-09	4.98

Notes. The bold coding indicates a statistical significance at $p < .05$ (red colored) and shaded cells indicate statistical significance at $p < .10$.

Model 2 entered 10 county-level characteristics to determine whether they were predictive of mental health service utilization among older Asians independently of individual characteristics.[16] Model 2 was also significant ($\chi^2 = 355.09$, $p < .001$), and the pseudo R^2 was .275. Model 2 identified three significant variables to explain mental health service utilization. The individual variables that were predictive of mental health service utilization in Model 1 remained significant in Model 2. A higher level of income (OR = 1.76) increased the odds of using mental health services, whereas having better SF-12 mental health status decreased the odds of mental health service utilization (OR = 0.92). Speaking English in the home may be related to increased use of mental health services ($p = .094$).

Among the county-level characteristics, only one variable was predictive of mental health service utilization of older Asians. Living in a county with a higher proportion of older adults decreased the odds of using mental health services (OR = 0.65). However, other variables of proportion of Asians, unemployment rate, community mental health center, PCP and mental health professional shortage area, median home value, and county mood disorder prevalence were not predictive of mental health service utilization of older Asians. Three variables were significant at $p < .10$; a higher proportion of high school diploma and greater numbers of mental health professionals may be related to increased use of mental health services, whereas a higher median home value may be related to decreased use of mental health services.

[16] One variable, *metropolitan county* was dropped in the analysis because there was very limited variability in the variable.

Summary

Table 21 provides a summary of analyses showing whether the findings are consistent or vary across the Hispanic, Black, and Asian samples. Better SF-12 mental health status decreased the odds of using mental health services in all three groups, whereas psychological distress (i.e., K6) was related to increased use of mental health services of the Black sample only. Higher individual income was significant predictor of mental health service utilization of the Black and Asian samples but not the Hispanic sample. In addition, having a high school diploma significantly predicted mental health service utilization of older Hispanics but not of Blacks or Asians.

Table 21. *Summary of Multilevel Analyses across the Models*

Variables	Hispanic *n* = 1,146 G* = 156	Black *n* = 1,567 G* = 237	Asian *n* = 422 G* = 81
Level 1 (individual-level)			
Age			
Female			
Married			
High school diploma	+		
Foreign born			
No English spoken in home			
Attitudes toward health			
Income		+	+
Uninsured			
SF-12 (Physical health)			
SF-12 (Mental health)	-	-	-
K6	+		

Table 21. *Summary of Multilevel Analyses across the Models*

Variables	Hispanic *n* = 1,146 G* = 156	Black *n* = 1,567 G* = 237	Asian *n* = 422 G* = 81
Level 2 (county-level)			
Ages 60 and over	+		-
Proportion of Hispanic			
Proportion of Black		-	
Proportion of Asian			
Metropolitan county			
High school diploma			
Unemployment			
Community mental health center	+		
PCP shortage area			
Mental health shortage area			
Mental health professionals			
Median home value			
Depression prevalence			

Notes. * denotes number of groups. + indicates increased use of mental health services and – indicates decreased use of mental health services. Gray colored areas indicate that the variables were not entered in the analyses.

At the county level, the findings varied across the groups. A higher proportion of older adults increased the odds of using mental health services of older Hispanics, whereas it decreased the odds of using mental health services of older Asians. However, there was no significant relationship between a proportion of older adults and mental health service utilization of older Blacks. In addition, a higher proportion of Black residents was related to decreased use of mental health services of older Blacks, but the proportion of Hispanic residents and the proportion of Asian residents were not significant. The existence of community mental health centers significantly predicted

mental health service utilization of older Hispanics, whereas it was not a significant predictor of mental health service utilization of older Blacks and Asians. Overall there was some consistency in findings at the individual level, but there was no consistency in findings at the county level.

CHAPTER 5: DISCUSSION

This chapter summarizes the results and describes how the findings relate to prior research and theory. The strengths and limitations of this study are also discussed. This chapter concludes with the implications for theory, social work practice and policy, and future research.

Individual-level Sample Characteristics

Similar to previous studies, mental health service utilization of older Hispanics (6.2%), Blacks (5.4%), and Asians (2.9%) was low in this study. In the National Latino and Asian American Survey, 5.5% of community-dwelling older Latinos and 4.7% of community-dwelling older Asians used mental health services (Kim et al., 2010). Another study found that among those with nonspecific psychological disorders, 24.1% of older Latinos and 14.5% of older Blacks initiated mental health care (Jimenez et al., 2013). The differences in findings may be due to sample or method differences.

Most individual-level characteristics varied by older Hispanics, Blacks, and Asians. For example, older Asians had higher levels of socioeconomic status than older Hispanics and Blacks. In addition, the three groups' socioeconomic status was not always consistent with that of the overall population of U.S. older adults. For example, 21% of older Hispanics lived below the poverty line in this study compared to 27% of older Hispanics in the U.S. in 2010, while 45% of older Hispanics earned a high school diploma in this study, which is similar to 44% of older Hispanics in the U.S. in 2010 (U.S. Census Bureau, 2014). Among older Black respondents, 22% of older Blacks lived below the poverty line in this study compared to 27% of older Blacks in the U.S. in 2010; 67% of older Blacks earned a high school diploma in this study, compared to 63% of

older Blacks in the U.S. population in 2010 (U.S. Census Bureau, 2014). In addition, older Asians in this study resembled and differed from the U.S. Asian population as a whole in terms of socioeconomic characteristics. For example, about 11% of older Asians lived below the poverty line in this study, similar to 12% of older Asians in the U.S. in 2010. In contrast, 79% of older Asians earned a high school diploma in this study, compared to 69% of older Asians in the U.S. population in 2010 (U.S. Census Bureau, 2014).

County-level Sample Characteristics[17]

There were some similarities between characteristics of the U.S. as a whole and those of the counties where the older Hispanic, Blacks, and Asian samples resided. For example, 19% of the county residents on average were older adults ages 60 and over in this study compared to 22% in the U.S. as a whole. The percentage of those with a high school diploma (57%) and the unemployment rate (8.5%) in the counties where the samples resided were almost the same as those of the U.S. as a whole (57% and 8.1%, respectively). The rate of reporting a mood disorder, which ranged from 13%-14% in the counties studied, was very similar to the rates reported in the U.S. as a whole (14%).

However, there were also some noticeable differences between the U.S. as a whole and the counties where the sample respondents resided. Above all, older Hispanics, Blacks, and Asians lived in counties with higher proportions of racial and ethnic minorities. For example, the proportion of Hispanic residents of counties where the Hispanic sample resided was 22%, which is much higher than that in the U.S. as a whole

[17] County-level sample characteristics were compared to those of county-level characteristics in the U.S. as a whole, which was obtained from the AHRF (see Table 5).

(8%); the differences were similar in the older Black (19% versus 9%) and Asian (8% versus 1%) samples. About 90% of counties where the sample resided were metropolitan counties compared to 37% in the U.S. as a whole. In terms of median home value, the samples were living in more affluent counties than those in the U.S. as a whole (an average of $210,000-$310,000 versus $130,000).

In addition, counties included in the study had more health care resources that in the U.S. as a whole. More than 40% of counties where the study samples resided (range 41%-47%) had a community mental health center compared to 11% in the U.S. as a whole. On average, each county had more than 40 mental health professionals per 100,000 county residents, which is much higher than the 18 mental health professionals per 100,000 county residents in the U.S. as a whole. In this way, the counties where the samples resided differed from the U.S. as a whole, and the differences were consistent across all three samples.

Individual-level Characteristics Predicting Mental Health Service Utilization

As Andersen's (2008) model suggests, this study's findings support that individual-level characteristics are essential to understanding mental health service use. Above all, better mental health status decreased the odds of using mental health services of older Hispanics, Blacks, and Asians. The findings were consistent with those from a systematic review of studies using Andersen's model; greater perceived and evaluated mental health needs were related to greater service utilization (Babitsch et al., 2012). The significant relationship between greater needs and greater service use may be because people with a mental health problem are more likely to seek out mental health treatment. Although lay persons may not perceive their mental health symptoms, health care

professionals may recognize the symptoms as requiring necessary treatment (Andersen, Davidson, & Baumeister, 2014). In studies using national data, older adults (i.e., Whites and Blacks) with any DSM-IV diagnosis were more likely to use mental health services (Kim et al., 2013), and older Asians and Latinos with any mood disorder were more likely to utilize mental health services than those without any mood disorders (Kim et al., 2010). In addition, preventive screenings are recommended to detect mental health symptoms so that those in need can be referred for further assessment and treatment, if needed. For example, the Affordable Care Act (ACA) includes treatment of mental health and substance use disorders and preventive health services as essential health benefits and Medicare annually provides screenings for depression and alcohol use to its beneficiaries (CMS, 2016). In this way, mental health status is an indispensable condition for use of mental health services.

Socioeconomic status had a differential impact on mental health service use of older Hispanics, Blacks, and Asians. For older Hispanic respondents, having a high school diploma was associated with increased use of mental health services. A systematic review assessed that a higher level of education was related to greater health and mental health service utilization in 6 out of 11 studies (Babitsch et al., 2012). Other studies also found that a higher level of education was closely related to increased use of mental health services of Hispanics (Dobalian & Rivers, 2008), and that those with a college degree were more likely to use mental health services compared to those without a high school diploma (Kim et al., 2013).

Educational attainment of older Hispanics (45% were high school graduates in this study) is relatively low compared to other racial and ethnic groups. Older Hispanics

might have experienced disadvantages regarding educational attainment during their early years; as a result, they may have limited employment opportunities and may have accumulated limited financial resources (Aranda, 2016). Often combined with financial difficulties, lower levels of education may limit access to mental health services as well as adherence to evidence-based interventions and medications (Aranda, 2016).

Education may be an indicator of health literacy. According to a report from the National Assessment of Adults Literacy, about 49% of adults without a high school diploma had below basic health literacy compared with 15% of those with a high school diploma (White, 2008). Those with a higher level of education may be more likely to be aware of symptoms and community resources, and as a result, may be more able to utilize a resource that they need for care (Aranda, 2016). Overall, Hispanic adults had the lowest health literacy score compared to other racial and ethnic groups; 41% of Hispanic adults had below basic health literacy, followed by Blacks (24%), Asians (13%), and Whites (9%) (White, 2008). Low health literacy has been shown to impact obtaining appropriate health care (Aranda, 2016).

In addition, older Hispanics with higher levels of education may associate less stigma with mental health care. In a systematic review of public stigma toward mental illness, Parcesepe and Cabassa (2013) suggested that higher levels of education are related to reduced stigma: people with higher levels of education perceived individuals with a mental disorder as less dangerous and people with higher education endorsed lesser social distance. Similarly, older adults with higher levels of education expressed positive attitudes towards seeking mental health services (Kessler, Agines, & Bowen, 2015); as a result, they may be more likely to use mental health services.

Economic resources are strongly related to the ability to obtain mental health services, and also appeared to play a role in mental health service use of older Blacks and Asians in this study. Older Blacks and Asians with higher incomes were more likely to use mental health services compared to those with lower incomes. These findings are similar to previous work reporting that lower-income racial and ethnic minorities are less likely to access mental health care (Dobalian & Rivers, 2008). In a study using the 2000-2001 Health Care for Communities data, higher income adults were more likely to access mental health services compared to people with less than $20,000 in annual income (Stockdale et al., 2007).

Older Blacks and Asians have limited income compared to their White counterparts. According to the U.S. Census 2010, the median income for older Blacks and Asians was $16,463 and $17,977, respectively, whereas the median income for older Whites was $27,214 (U.S. Census Bureau, 2014). In addition, 18% of older Blacks and 14.6% of older Asians lived below the poverty line in 2010 compared to 6.8% of non-Hispanic Whites (U.S. Census, 2014). Regardless of race and ethnicity, low-income older adults may not have enough money for paying for health and mental health care costs as well as housing and other necessary costs. Thus, economic resources play a major role in initiating a health care service (Andersen, 1968, 1995). However, income was not associated with mental health service utilization of older Hispanics in this study. It may be because education may partially explain the role of income for older Hispanics, considering that lower levels of education are closely related to having limited financial resources (Aranda, 2016).

County-level Characteristics Predicting Mental Health Service Utilization

Andersen (2008) suggests that contextual predisposing, enabling, and need characteristics have impacts on health service utilization, but Andersen's model was only partially supported in this study; demographic characteristics of a county (i.e., proportion of older adults for older Hispanics and Asians; proportion of Blacks for older Blacks) had significant associations with mental health service utilization and only one enabling characteristic for older Hispanics (i.e., existence of a community mental health center) was significant. This study shows county context may play a role in improving access to mental health care of older racial and ethnic minorities, even after adjusting for individual-level effects.

Community mental health center. The existence of a community mental health center increased the odds of mental health services utilization of older Hispanics, compared to counties without a community mental health center. This finding was consistent with the previous study reporting that Hispanic adults living in a county with a community mental health center were more likely to use any mental health services in the past year (Cook et al., 2013).

Community mental health centers must provide outpatient mental health services as well as 24-hour emergency care services and screening for patients who can be admitted to state mental health facilities (HRSA, 2014). Community mental health centers were created by the Community Mental Health Centers Construction Act in 1963, which provided counseling and crisis intervention programs for people with acute problems (Cummings, Cassie, & Trecartin, 2016). The act designated mental health catchment areas consisting of 100,000 to 200,000 people and provided more financial

incentives to community mental health centers serving high poverty areas (Cutler, Bevilacqua, & McFarland, 2003). In 1981, there were only 751 community mental health centers for 1,500 mental health catchment areas, and the Reagan administration dramatically reduced funds to the community mental health centers (Cutler et al., 2003).

Currently, community mental health centers serve more than 1.4 million individuals with mental disorders each year (SAMHSA, 2016). Although community mental health centers were federally funded at their inception, their funding mechanisms were diversified (Cummings et al., 2016). Most community mental health centers receive payments from Medicare, Medicaid, and state and local governments (Koizumi, Rothbard, Smith, & Mayer, 2011). The U.S. Department of Health and Human Services requires that a community mental health center should provide at least 40% of its services to people who are not eligible for Medicare (American Medical Association [AMA], 2015), and most clients of the centers are low-income individuals (Koizumi et al., 2011).

Community mental health centers may also be particularly effective in providing culturally sensitive substance abuse and mental health services to their clients (Cummings, Cassie, & Trecartin, 2016). It seems that community mental health centers may be effectively reaching older Hispanics. About 61% of community mental health centers provided treatment services in languages other than English, including Spanish (45.7%) and other languages (11.6%) in 2014 (SAMHSA, 2016). The fact that nearly half of community mental health centers provide their services in Spanish may increase access to care of the older Hispanics.

As shown in the sample characteristics, the Hispanic sample in this study is more likely to be uninsured (17%), compared to Blacks (7%) and Asians (6%). As a result, it is

possible that older Hispanics are more likely to visit a community mental health center, instead of visiting a private hospital. However, community mental health centers did not impact mental health service use of older Blacks and Asians. In addition, each community mental health center differs in the types of mental health services and amount of services provided to community residents (Cummings et al., 2016), but this study does not include more information on community mental health centers, so that it is difficult to compare the effect of the community mental health centers to the three groups.

Proportion of older adults. A higher proportion of older adults in a county increased the odds of mental health services utilization of older Hispanics, whereas older Asians living in a county with a higher proportion of older adults were less likely to use mental health services. However, proportion of older adults in a county was not predictive of mental health service utilization of older Blacks. In general, communities with a higher proportion of older adults have a different combination of available health services and health care facilities for older adults compared to counties with younger adults (Andersen et al., 2014). As a result, the counties with a higher proportion of older adults are more likely to have available health care resources to meet the needs of older adults. In this way, it seems that counties that were included in this study had more available health care services for older Hispanics than U.S. counties as a whole. According to the 2014 National Mental Health Services Survey, about 47% of outpatient mental health facilities provided services in Spanish (SAMHSA, 2016). In addition, higher proportions of older adults were associated with higher proportions of high school graduates. Andersen and Davidson (2007) suggest that a community with people with higher levels of education may provide a more supportive environment to access to health

services. Older Hispanics living in a county with a higher proportion of older adults were less likely to be foreign-born and to be uninsured in this study than those living in a county with a lower proportion of older adults, so it could be that they associate less stigma with the use of mental health services.

It is not clear why a higher proportion of older adults in a county decreased use of mental health services of older Asians. It may be that health care facilities had some limited capabilities to serve older Asians even though older Asian respondents were more likely to live in a county with more health care resources than the older Hispanic and Black sample and in the U.S. as a whole. Research suggests that older Asians have more limited knowledge of service availability and as well as limited English proficiency (Min & Moon, 2016). It could be that these factors make it difficult for a health care facility to expand services to serve older Asians. Another possible explanation is that older may be reluctant to talk about their mental health symptoms even if there is a mental health facility in the community. Older Asians may worry that someone else may find out about their mental illness (Sorkin et al., 2016), possibly because they do not want to lose dignity within their social network (Jimenez et al., 2012). One study reported that about 30% of older Asians would not talk to anyone about their mental health status although they have mental health symptoms (Jimenez, Bartels, Cardenas, Dhaliwal, & Alegría, 2012).

Proportion of racial and ethnic minorities. This study found that a higher proportion of Black residents in a county decreases the odds of using mental health services of older Blacks. A study conducted in Los Angeles, Chicago, and Washington D.C. also reported that higher proportions of Black population in census tracts was

associated with lower access to mental health and substance abuse services compared to census tracts with lower proportions of Blacks (Roth & Allard, 2016), perhaps as an effect of concentrated poverty. In general, African Americans live in disadvantaged areas where there is limited access to mental health care (Bustamante, Morales, & Ortega, 2014; Cook et al., 2013), which may be due to discrimination in the housing market and as a result, African Americans are more likely to separately live from people of other races and ethnicities (Dinwiddie et al., 2013). Also, there may be regional differences. In general, about half of older Black respondents resided in the South region in MEPS and CPES (Kim et al., 2013). The South has lower proportions of psychologists compared with the West, the Northeast, and some states in the Midwest (Miller, Petterson, Burke, Phillips, & Green, 2014) and fewer mental health professionals than the Northeast and the West (Ellis et al., 2009). Kim and colleagues (2013) found that older Blacks in the South were less likely to use mental health services than older Whites in the South, whereas there were no group differences in the Northeast, Midwest, and West regions. Areas where African Americans are predominant have limited resources for mental health care, resulting in limited access to mental health care of the population (Dinwiddie et al., 2013).

Ethnic minorities tend to interact with people who are similar to themselves and as a result, ethnic homogeneity may enhance shared beliefs or group cohesion (Collins, Z. Neal, & J. Neal, 2016). Older Blacks may underuse mental health services resulting from distrusting medical professionals (Akincigil et al., 2012). The interactions may affect mental health service use of older Blacks; in a study using data from the Chicago Health and Aging Project, African Americans had low healthcare trust scores compared to non-

Hispanic Whites (Guerrero, de Leon, Carlos, Evans, & Jacobs, 2015). It was expected that ethnic homogeneity would influence mental health service utilization of older Hispanics and Asians, but the proportions of Hispanic residents and Asian residents in a county were not associated with mental health service utilization of the older Hispanic and Asian samples. Older Hispanics and Asians come from different cultures and nationalities (Jimenez et al., 2012), and they live in more affluent areas than older Blacks, which may reduce effects of mental health service utilization of these populations.

Strengths and Limitations

This study has limitations that should be noted. First, the narrow definition of mental health service utilization (i.e., an actual mental health professional visit) may misrepresent mental health service use among racial and ethnic minorities. Racial and ethnic minorities may prefer talking about their mental health concerns to non-mental health professionals from the human service sector and spiritual providers (Chatters et al., 2011; Villatoro, Morales, & Mays, 2014). In addition, they may prefer alternative treatment options. The MEPS does not have these data, so I was not able to examine an alternative mental health services use. In addition, this study did not look at numbers of mental health service visits although examining service continuity by older adults may provide another perspective to understand the service accessibility.

Another limitation is that this study could not include other plausible variables (e.g., discrimination, stigma, relationships between a provider and a patient) to explain mental health services use, because these variables were not available in the data. Although this study includes a scale about attitudes toward health, older racial and ethnic minorities may have limited knowledge of mental health and/or may have culturally

different beliefs about mental health services (Alvarez et al., 2014; Chadiha et al., 2016; Min & Moon, 2016 Sorkin et al., 2011) that may not be captured on this scale. This study also could not use an actual diagnosis of depression and anxiety at the individual level because the MEPS only included self-reported measures (e.g., K6 and SF-12). In addition, this study did not explore the relationship between a provider and a patient; experiences of discrimination and mistrust of a health care professionals are important variables to be examined (Guerrero et al., 2015). Although the density of mental health providers may impact on mental health service utilization (Cook et al., 2013), this study did not include numbers of social workers because the data were not available. Clinical social workers have provided mental health services in a variety of settings as a majority of mental health professionals (60%) compared with psychologists (23%), psychiatrists (10%), and psychiatric nurses (5%) (NASW, 2017). In addition, Medicaid recipients may have less access to mental health services than those with private insurance, but this study only looked at the difference between uninsured and insured and did not look at differences based on the types of insurance.

Although this study includes a national sample of older Hispanics, Blacks, and Asians, it does not have sufficient sample sizes to examine within-group heterogeneity. The three groups (i.e., Blacks, Latinos, or Asians) are heterogeneous groups because ethnic populations from each group may use different languages, originate from diverse cultural backgrounds, and have very different immigration histories (Alvarez et al., 2014; Chadiha et al., 2016; Sorkin et al., 2011). For example, in the case of older Hispanics, individuals from Mexico, South America, and other Latino cultures have different cultural backgrounds, health behaviors, and beliefs. Treating these groups as

homogeneous may limit this study's ability to examine mental health service utilization specific to different Hispanic, Black, and Asian ethnic groups. In addition, the number of older Asians who used mental health service was very small, and as a result, I conducted hierarchical logistic regression analyses instead of multilevel modeling analyses. Therefore, results should be interpreted with caution.

This study included all counties that had older adults who were Hispanic, Black, or Asian. County-level characteristics of the sample differed from characteristics of U.S. counties as a whole. For example, about 90% of counties where the sample resides were metropolitan counties compared to 37% in the U.S. as a whole. Also, county samples had more health care resources (e.g., a number of mental health professionals and community mental health centers) and were more affluent than U.S. counties as a whole. Therefore, the findings of this study may not generalize to U.S. counties as a whole.

In addition, using counties as a unit of analysis may have limitations for increasing our understanding of mental health service utilization of older Hispanics, Blacks, and Asians. For example, 50% of counties where the Hispanic sample resided were partially primary care physician shortage areas; similarly, about 52% of counties were partially mental health professional shortage areas. Very similar patterns were also found in the counties with older Black and Asian respondents. These patterns indicate that variability exists within counties. Therefore, future research should examine smaller units of analysis to better understand the impact of within-county variability.

In addition, methodological limitations should be noted. About 99% of the sample was interviewed in English or Spanish, so this study may have sample bias because a respondent who was not comfortable in English or Spanish might have declined to take

part in the survey. In particular, the interview languages can have an impact on older Asians who speak different languages. Also, this study does not include older adults in residential care settings, because the data were collected from non-institutionalized populations only. Thus, these methodological limitations can be a threat to external validity.

Despite its limitations, this study has several strengths. Above all, this study suggests that county contexts may be helpful to understand mental health service utilization among older racial and ethnic minorities, even adjusting for individual-level characteristics. Most studies have focused on examining relationships between individual characteristics and mental health service utilization of older racial and ethnic minorities (e.g., Gonzalez et al., 2015; Jimenez et al., 2013). Although previous studies have explored the role of county or community characteristics to explain mental health service utilization, most have focused on the general population, not exclusively on older adults (e.g., Cook et al., 2013; Stahler et al., 2009; Stockdale et al., 2007). This study may provide meaningful information on understanding of the role of county contexts related to mental health services utilization of older racial and ethnic minorities.

Another strength is that this study used actual service visits obtained from health and mental health service providers to measure mental health service utilization. Mental health service utilization has been inconsistently operationalized in studies. Some studies define mental health service use as visiting specialty mental health professionals (e.g., Dobalian & Rivers, 2008; Ojeda & McGuire, 2006). Other studies ask whether respondents talk to professionals from the human service sector and spiritual providers to capture any efforts to receive mental health services (e.g., Fortuna et al., 2008; Kim et al.,

2013). Depending on respondents' memory may result in recall bias, and household respondents may not provide accurate answers. However, the MEPS uses medical providers' records, so it is helpful to prevent respondents' recall bias.

The MEPS also has the advantage of providing information on actual provider visit dates (i.e., year, month, and day). Most cross-sectional studies may have limitations in establishing a causal relationship because researchers observe potential causes and effects at one time point. For example, most studies ask whether a person used a mental health service during the past 12 months (Kim et al., 2013), but the MEPS gathers information on mental health services from payment records to providers over two years after collecting respondents' health and mental health status information at the beginning of data collection. Additionally, this study analyzed the data collected from a nationally representative sample.

Implications

As one of the few studies examining the role of county context associated with mental health service utilization of older racial and ethnic minorities, this study has implications for theory, practice, and policy.

Theory. The theoretical framework for this study, Andersen's (2008) Behavioral Model of Health Service Utilization is useful in the field of mental health and mental health service research. In particular, understanding the context where people reside is important because people use health and mental health services within a larger context (e.g., neighborhood/community) (Cook et al., 2013). Andersen's model is comprehensive in that it incorporates contextual characteristics (e.g., sociodemographic characteristics at the community-level, health care policy, and population health indices) as well as

individual-level characteristics, whereas many health behavior theories (e.g., Health Belief Model (Rosenstock, 1974); Theory of Planned Behavior (Fishbein & Ajzen, 2010)) focus on individual-level characteristics to explain an individual's health behavior. As suggested in the model, this study found that contextual characteristics (i.e., county context) can play a role in explaining mental health service utilization, although the contribution of these factors may be modest compared with the clinical presentation of the client.

In addition, individual-level characteristics were indispensable to understanding mental health service use, and this was consistent with Andersen's model as well. When seeking help, a person's belief that a service is discretionary or non-discretionary is an important factor influencing health care decisions (Andersen, 1968). For example, people think that treating an injury by falling is non-discretionary, and they use a health care service. However, older adults may think that treatment for depression is discretionary because of stereotypes claiming that depression can be a normal part of aging that does not require immediate treatment. When a person's discretion is high, the enabling characteristics became more important to understand health service use (Andersen, 1968). In fact, individual resources (i.e., income) for older Blacks and Asians and community resources (i.e., community mental health center) for older Hispanics were significant predictors of mental health services utilization.

However, this study has limitations for understanding mental health service utilization employing Andersen's (2008) model because of the data available to test the model in this study. Many of the variables that were included in this study were not statistically significant although the variables were selected based on Andersen's model.

Andersen's model does not specify key variables to explain health service utilization. This may be because Andersen's model was developed by expanding previous research findings with nationwide data (Andersen, 1968) so that the previous studies have used a variety of variables (Babitsch et al., 2012). As a result, significant variables of health and mental health service utilization differed from study populations and context (Babitsch et al., 2012). Although Andersen (2008) developed a full framework to explain health service utilization, only limited studies tested contextual characteristics (Babitsch et al., 2012), so that the model needs to be tested with more contextual variables to examine its utility.

Practice and Policy. In general, the mental health service utilization of older racial and ethnic minorities is low (i.e., older Hispanics: 6.2%, older Blacks: 5.4%, older Asians: 2.9%), considering 13.8% of older Hispanics, 9.9% of older Blacks, and 7.6% of older Asians had a potential mental health symptom.[18] This suggests that approximately half of those with potential mental health needs may not be receiving mental health services. Mental health service utilization in this study was also low compared to older adults ages 65 or older with one or more mental health disorder (Hispanic: 11.7%, Black, 7.7%, Asian/Native Hawaiian/Pacific Islander: 9.0%) (IOM, 2012). Differences in utilizing formal mental health services may be because older racial and ethnic minorities have preferred mental health providers (e.g., religious/spiritual leader, family, and alternative providers) or type of treatment (medications, spiritual advice) (Jimenez et al., 2012).

[18] The calculations are based on those with the K6 score higher than 12 and the PHQ-2 score higher than 2 (Jimenez et al., 2013).

To improve access to mental health care by older racial and ethnic minorities, social workers should understand preferences for mental health care by racial and ethnic minorities. For example, older Hispanics may have a variety of stresses from migration and relocation (Alvarez et al., 2014), and are more likely to talk with family members than medical doctors (Jimenez et al., 2012). A study reported that cultural and linguistic adaptation to depression treatments were effective for low-income Hispanics (Aranda, 2016). Older Blacks preferred spiritual advice for mental health treatment than any other racial and ethnic groups (Jimenez et al., 2012). A previous study also confirmed that a church network can protect older Blacks against depression (Chatters et al., 2015). Social workers may provide information on mental health symptoms and community resources to religious leaders who already have trusting relationships with ethnic minorities.

Surprisingly, about 30% of older Asians would not talk to anyone about their mental health compared to 5.8% of Blacks and 6.6% of Hispanics; instead, they preferred talking to a spouse or family member about their mental health (Jimenez et al., 2012). This may be because older Asians do not feel comfortable communicating with health care professionals (Sorkin et al., 2016). Social workers may establish referral systems to healthcare providers who speak the same language and who are from the same ethnic groups. Professionals with similar cultural backgrounds can better understand older Asians' culture than those from a different background (Jimenez et al., 2012).

Social workers should understand facilitators or barriers to using mental health services. This study found that older Hispanics with a high school diploma were more likely to use mental health services than those without a high school diploma. The level of education may determine individuals' ability to manage present health conditions and

to locate available community resources to cope with the problems (Andersen et al., 2014). Social workers have knowledge and skills identifying and utilizing evidence-based assessment tools for mental health issues, and should provide increased screenings for mental health to older Hispanics without a high school diploma when they access other services.

This study also found that older Blacks and Asians with higher levels of income were more likely to use mental health services than those with lower levels of income. Individuals' economic resources also determine their ability to pay for services (Andersen et al., 2014). Social workers should actively advocate for low-income older adults who do not seek help because of their economic resources. Social workers may provide free screenings to detect mental health symptoms for older adults. Also, older Blacks and Asians may not know about available resources to pay for services, such as Medicaid and low-income subsidy programs for medications. If social workers identify individuals with mental health issues, they should refer older adults to a community agency providing evidence-based programs regarding mental health issues or refer to a clinic providing free or low-cost services.

For older Hispanics with lower levels of education and for low-income older Blacks and Asians, social workers should provide culturally appropriate interventions and collaborate with health and mental health professionals that would help access mental health care and improve the mental health status of those populations. For example, social workers were actively engaged in a randomized trial (i.e., Beat the Blues) to improve access to mental health services and improve treatment outcomes for depression of older African Americans (Gitlin et al., 2012). Social workers provided screenings for

depression in older African Americans and referred them to local mental health professionals if they had mental health symptoms; they also provided depression education and used behavioral activation (Gitlin et al., 2012). Another intervention program for older ethnic minorities is Healthy IDEAS (Identifying Depression, Empowering Activities for Seniors) (Casado et al., 2008). Healthy IDEAS provided depression education, referral, and behavioral activation to predominantly older Hispanics, and this program reported positive client outcomes (i.e., increased depression knowledge and reduced depressive symptoms) (Quijano et al., 2007). For Asian Americans, the Asian American Primary Health Care and Mental Health Bridge Program (BRIDGE) in New York can benefit older Asians because BRIDGE provides culturally appropriate care to Asian Americans with integrated services such as health, mental health, dental care, and care management (Nguyen, Shibusawa, & Chen, 2012)

When framing a policy or a program for mental health services, policymakers should consider both individual- and county-level predictors to improve access to care. Policymakers should support increasing numbers of community mental health centers and increase the accessibility to the centers, because the existence of community mental health centers increased the use of mental health services of older Hispanics. It may because almost half of community mental health centers were providing their services in Spanish (SAMHSA, 2016). Considering most older Hispanics and Asians speak other languages in home, increasing staff who speak Spanish and Asian languages may improve access to mental health care by those populations. In addition, only 11% of counties have a community mental health center in the U.S. as a whole. If community

mental health centers would be created in areas where older Blacks are dominant, mental health service utilization of older Blacks may increase.

As a higher proportion of Blacks were associated with decreased mental health services of older Blacks, policy should also support increasing culturally competent mental health professionals. In particular, Blacks may not trust a medical provider resulting from the legacy of distrust of the medical establishment (e.g., the Tuskegee Syphilis Study) (Bustamante et al., 2014). White males are overrepresented in the medical field, so that they may not effectively communicate with older Blacks because of unconscious stereotype and bias (Bustamante et al., 2014). Therefore, developing a mental health workforce that understands older Blacks' culture is important to improve access to mental health care of the Black population.

Future research. Future research should more fully examine Andersen's (2008) model by including policies regarding mental health services. In particular, the Affordable Care Act (ACA) has several initiatives to improve access to mental health services. For example, accountable care organizations may increase service utilization because the ACA provides financial incentives to a group of health care providers that provide integrative services including social services, case management, and health and mental health care (Bartels, Gill, & Naslund, 2015). The ACA also emphasizes preventive health care services including screening for depression and other mental health services by providing one-time "Welcome to Medicare" preventive visits and an annual wellness check-up to Medicare beneficiaries (CMS, 2016). Another program, Healthy People 2020, aims to increase the proportion of older adults who receive the Welcome to Medicare benefit from 6.4% in 2008 to 7.0% in 2020 (U.S. DHHS, 2017).

Evaluating the effect of these initiatives on mental health services utilization would be meaningful to improve access to mental health care of older adults, although the federal government may replace or repeal the ACA.

Future research should look into how the existence of community mental health centers increased mental health service utilization of older Hispanics. More detailed information on clients' demographic and socioeconomic status, staff (e.g., numbers of staff speaking Spanish and racial concordance), services provided (e.g., integrated mental health and health service in the center), proximity to a center, and a center's funding structure would be helpful to understand mental health services of older Hispanics in the community mental health centers.

Future research should look into the role of age composition in communities (i.e., a proportion of older adults) to understand mental health service utilization of older racial and ethnic minorities. This study's findings were inconsistent across older Hispanics, Blacks, and Asians. It may be that communities with higher proportions of older adults may have more age-appropriate available health care services and more health care facilities, resulting from more demand for services (Andersen, Davidson, & Baumeister, 2014). Or it may be related to more cultural differences of the three groups. However, it is difficult to explain why the differences exist if we do not have information on community level resources including the characteristics of health care facilities. Therefore, future research should examine the characteristics of communities with the higher proportion of older adults, including the number of mental health care professionals with similar cultural background to older racial and ethnic minorities and the existence of social service organizations serving older racial and ethnic minorities.

Social interactions in the communities with a higher proportion of older adults also can be different from those with a lower proportion of older adults. Communities with a higher proportion of older adults are more likely to be stable and may have greater social networks and support resulting in positive health outcomes (Cagney, 2006). In this way, understanding characteristics of the communities with higher proportions of older adults will be helpful to examine how age composition affects mental health service utilization of older racial and ethnic minorities.

In addition, future research should continue looking into the role of county contexts to understand mental health service utilization of older racial and ethnic minorities, considering that the findings varied across the samples. A study that can examine distance to services may be a particularly promising approach even when using larger units of analysis such as counties. Proximity or spatial access to service is very important in that it increases residents' service utilization; people have known service providers and used services in their communities (Roth & Allard, 2016). However, there was much variability within the counties in terms of health and mental health shortage areas. It is important for contextual characteristics to be both homogeneous within groups and heterogeneous between groups. Thus, future research should examine whether this study's findings are confirmed when employing different units of analysis (e.g., census tracts or blocks).

Future research should also consider characteristics that were not included in this study. At the individual-level, internalized and externalized stigma toward mental health symptoms and services, experiences of discrimination/racism, and beliefs about mental health services should be examined in the future research. For older racial and ethnic

minorities, social networks played a role in talking about mental health issues (Jimenez et al., 2012). This study suggests that socioeconomic status played a role in utilizing mental health services. The intersections of race and income and race and education should be examined to understand disparities of mental health and mental health services.

Conclusion

This study aimed to examine whether county contexts are associated with mental health service utilization of older Hispanics, Blacks, and Asians. Understanding county context where people reside is important because people use the mental health services that are in their communities. This study found that older Hispanics had lower levels of socioeconomic status than older Blacks and Asians. I also found that the counties that were included in this study had more health care resources than U.S. counties as a whole. Similar to findings in other studies, mental health service utilization of the older racial and ethnic minorities was low. Both individual- and county-level characteristics differently affected mental health service utilization of older Hispanics, Blacks, and Asians. For older Hispanics, this study identified that county characteristics (i.e., existence of community mental health centers and a higher proportion of older adults) increased mental health service utilization as well as individual characteristics of higher levels of education and worse mental health status. For older Blacks, this study found that a higher proportion of Blacks in a county decreased mental health service utilization as well as better mental health status, while higher levels of income increased mental health services use. Similar to older Blacks, income and mental health status were significant predictors of mental health service utilization of older Asians, and a higher proportion of older adults in a county decreased mental health service utilization. In this way, this study

identified different factors affecting mental health service use of each group, and will contribute to the existing literature that mostly has focused on the role of individual characteristics to understand mental health service utilization. Understanding both individual- and county-specific characteristics associated with mental health service utilization is essential to develop tailored outreach programs for each racial and ethnic group as well as to develop and evaluate mental health policy.

References

Abe-Kim, J., Takeuchi, D. T., Hong, S., Zane, N., Sue, S., Spencer, M. S., . . . Alegria, M. (2007). Use of mental health-related services among immigrant and US-born Asian Americans: Results from the national Latino and Asian American study. *American Journal of Public Health, 97*(1), 91-98. doi: 10.2105/AJPH.2006.098541

Administration on Aging. (n.d.). Unofficial Compilation of the Older Americans Act of 1965. Retrieved from http://www.aoa.gov/AoA_programs/OAA/oaa_full.asp#_Toc153957624

Agency for Healthcare Research and Quality. (2009). *Mental health: Research findings*. Retrieved from http://www.ahrq.gov/research/findings/factsheets/mentalhth.html

Agency for Healthcare Research and Quality. (2010a). *2010 National healthcare quality & disparities reports*. Retrieved from http://www.ahrq.gov/qual/qrdr10/17_utilization/T17_3_1-2a.htm

Agency for Healthcare Research and Quality. (2010b). *Estimation procedures for the 2007 Medical Expenditure Panel Survey household components* (Methodology report 24). Retrieved from http://meps.ahrq.gov/mepsweb/data_files/publications/mr24/mr24.pdf

Agency for Healthcare Research and Quality. (2013). *MEPS HC-147 2011 full year consolidated data file*. Rockville, MD: Author.

Agency for Healthcare Research and Quality. (2014). *MEPS workshop*. Rockville, MD: Author.

Agency for Healthcare Research and Quality. (n.d.). *Accounting for clustering in the analysis of MEPS data: Frequently asked questions*. Retrieved from http://meps.ahrq.gov/survey_comp/hc_clustering_faq.pdf

Akincigil, A., Olfson, M., Siegel, M., Zurlo, K., Walkup, J., & Crystal, S. (2012). Racial and ethnic disparities in depression care in community-dwelling elderly in the United States. *American Journal of Public Health, 102*(2), 319-328. doi: 10.2105/AJPH.2011.300349

Alvarez, P., Rengifo, J., Emrani, T., & Gallagher-Thompson, D. (2014). Latino older adults and mental health: A review and commentary. *Clinical Gerontologist, 37*(1), 33-48. doi: 10.1080/07317115.2013.847514

American Medical Association. (2014). *Mental health services*. Retrieved from https://www.cms.gov/Outreach-and-Education/Medicare-Learning-Network-MLN/MLNProducts/Downloads/Mental-Health-Services-Booklet-ICN903195.pdf

Andersen, R. (1968). *A behavioral model of families' use of health services*. (Research series. No. 25). Chicago, IL: The Center of Health Administration Studies.

Andersen, R. (1995). Revisiting the behavioral model and access to medical care: Does it matter? *Journal of Health and Social Behavior, 36*(1), 1-10. Retrieved from http://globalhealth.stanford.edu/resources/Revisiting_Behavioral_Model_and_Access.pdf

Andersen, R. (2008). National health survey and the behavioral model of health services use. *Medical Care, 46*(7), 647-653. doi: 10.1097/MLR.0b013e31817a835d

Andersen, R., & Davidson, P. (2007). Improving access to care in America: Individual and contextual indicators. In R. Andersen, T. Rice & J. Kominski (Eds.), *Changing the U.S. health care system: Key issues in health services policy and management* (pp. 3-31). San Francisco, CA: John Wiley & Sons.

Andersen, R., Davidson, P, & Baumeister, S. (2014). Improving access to care. In G. Kominski (Ed.), *Changing the U.S. health care system: Key issues in health services policy and management* (pp. 33-64). San Francisco, CA: Jossey-Bass.

Aranda, M. (2016). Social work practice with older Latinos in the United States: A mental health perspective. In D. Kaplan & B. Berkman (Eds.), *The Oxford handbook of social work in health and aging* (pp. 527-533). New York, NY: Oxford University Press.

Babitsch, B., Gohl, D., & von Lengerke, T. (2012). Re-visiting Andersen's behavioral model of health services use: A systematic review of studies from 1998-2011. *GMS Psycho-Social-Medicine, 9,* 1-15. doi: 10.3205/psm000089

Bartels, S. J., Gill, L., & Naslund, J. A. (2015). The Affordable Care Act, accountable care organizations, and mental health care for older adults: Implications and opportunities. *Harvard review of psychiatry*, *23*(5), 304-319.

Bennett, D. A. (2001). How can I deal with missing data in my study? *Australian and New Zealand Journal of Public Health*, *25*(5), 464-469.

Bickel, R. (2007). *Multilevel analysis for applied research: It's just regression*! New York, NY: The Guilford Press.

Bustamante, A., Morales, L., & Ortega, A. (2014). Racial and ethnic disparities in health care. In G. Kominski (Ed.), *Changing the U.S. health care system: Key issues in*

health services policy and management (pp. 103-134). San Francisco, CA: Jossey-Bass.

Casado, B. L., Quijano, L. M., Stanley, M. A., Cully, J. A., Steinberg, E. H., & Wilson, N. L. (2008). Healthy IDEAS: Implementation of a depression program through community-based case management. *The Gerontologist*, *48*(6), 828-838.

Centers for Disease Control and Prevention, (2017). *Depression is not a normal part of growling older*. Retrieved from https://www.cdc.gov/aging/mentalhealth/depression.htm

Centers for Medicare & Medicaid Services. (2014a). *Medicare & your mental health benefits.* Retrieved from http://www.medicare.gov/pubs/pdf/10184.pdf

Centers for Medicare & Medicaid Services. (2014b). *Chronic conditions among Medicare beneficiaries: A methodological overview*. Retrieved from http://www.cms.gov/Research-Statistics-Data-and-Systems/Statistics-Trends-and-Reports/Chronic-Conditions/Downloads/Methods_Overview.pdf

Centers for Medicare & Medicaid Services. (2016). *Medicare and your mental health benefits* (CMS Product No. 10184). Retrieved from https://www.medicare.gov/pubs/pdf/10184-Medicare-Mental-Health-Bene.pdf

Chadiha, L., Rozario, P., Aranda, M., & Fielding, A. (2016). Older African Americans and other Black populations. In D. Kaplan & B. Berkman (Eds.), *The Oxford handbook of social work in health and aging* (pp. 505-514). New York, NY: Oxford University Press

Chatters, L. M., Mattis, J. S., Woodward, A. T., Taylor, R. J., Neighbors, H. W., & Grayman, N. A. (2011). Use of ministers for a serious personal problem among

African Americans: Findings from the National Survey of American Life (NSAL). *The American Journal of Orthopsychiatry, 81*(1), 118–127. doi:10.1111/j.1939-0025.2010.01079.x

Chatters, L. M., Taylor, R. J., Woodward, A. T., & Nicklett, E. J. (2015). Social support from church and family members and depressive symptoms among older African Americans. *The American Journal of Geriatric Psychiatry, 23*(6), 559-567. doi:10.1016/j.jagp.2014.04.008

Chum, A., Skosireva, A., Tobon, J., & Hwang, S. (2016). Construct validity of the SF-12v2 for the homeless population with mental illness: An instrument to measure self-reported mental and physical health. *PLoS ONE, 11*(3), 1-19. doi:10.1371/journal.pone.0148856

Choi, S. (2014). How does satisfaction with medical care differ by citizenship and nativity status?: A county-level multilevel analysis. *The Gerontologist.* Advance online publication. doi:10.1093/geront/gnt201

Chow, J., Jaffee, K., & Snowden, L. (2003). Racial/ethnic disparities in the use of mental health services in poverty areas. *American Journal of Public Health, 93*, 792-797.

Chowdhury, S., & Mirel, L. (2014). MEPS-HC statistical estimation and analysis issues. *MEPS Workshop*. Rockville, MD: Agency for Healthcare Research and Quality.

Chronic Conditions Data Warehouse. (2015). *Welcome to the chronic conditions data warehouse.* Retrieved from https://www.ccwdata.org/web/guest/home

Cohen, J., Cohen, P., West, S. G., & Aiken, L. S. (2013). *Applied multiple regression/correlation analysis for the behavioral sciences* (3rd ed.). Mahwah, NJ: Lawrence Erlbaum Associates.

Collins, C. R., Neal, Z. P., & Neal, J. W. (2016). Transforming social cohesion into informal social control: Deconstructing collective efficacy and the moderating role of neighborhood racial homogeneity. *Journal of Urban Affairs*. Advance online publication. doi: 10.1080/07352166.2016.1245079

Cook, B. L., Doksum, T., Chen, C. N., Carle, A., & Alegría, M. (2013). The role of provider supply and organization in reducing racial/ethnic disparities in mental health care in the US. *Social Science & Medicine*, *84*, 102-109. doi: 10.1016/j.socscimed.2013.02.006

Cummings, S., Cassie, K., & Trecartin, S. (2016). Community mental health centers. In D. Kaplan & B. Berkman (Eds.), *The Oxford handbook of social work in health and aging* (pp. 141-149). New York, NY: Oxford University Press.

Cutler, D. L., Bevilacqua, J., & McFarland, B. H. (2003). Four decades of community mental health: A symphony in four movements. *Community Mental Health Journal*, *39*(5), 381-398.

DeFranco, E. A., Lian, M., Muglia, L. A., & Schootman, M. (2008). Area-level poverty and preterm birth risk: A population-based multilevel analysis. *BMC Public Health, 8*(316), 1-9. doi: 10.1186/1471-2458-8-316

Dinwiddie, G. Y., Gaskin, D. J., Chan, K. S., Norrington, J., & McCleary, R. (2013). Residential segregation, geographic proximity and type of services used: Evidence for racial/ethnic disparities in mental health. *Social Science & Medicine, 80,* 67-75. doi: 10.1016/j.socscimed.2012.11.024

Dobalian, A., & Rivers, P. A. (2008). Racial and ethnic disparities in the use of mental health services. *Journal of Behavioral Health Services & Research, 35*(2), 128-141. doi:10.1007/s11414-007-9097-8

Druss, B. G., von Esenwein, S. A., Compton, M. T., Rask, K. J., Zhao, L., & Parker, R. M. (2009). A randomized trial of medical care management for community mental health settings: The Primary Care Access, Referral, and Evaluation (PCARE) study. *American Journal of Psychiatry*, *167*(2), 151-159.

Ellis, A. R., Konrad, T. R., Thomas, K. C., & Morrissey, J. P. (2009). County-level estimates of mental health professional supply in the United States. *Psychiatric Services, 60*(10), 1315-1322.

Federal Interagency Forum on Aging-Related Statistics. (2016). *Older Americans 2016: Key indicators of well-being.* Federal Interagency Forum on Aging-Related Statistics, Washington, DC: U.S. Government Printing Office.

Fishbein, M., & Ajzen, I. (2010). *Predicting and changing behavior: The reasoned action approach*. New York, NY: Psychology Press.

Fleishman, J., Selim, A., & Kazis, L. (2010). Deriving SF-12v2 physical and mental health summary scores: A comparison of different scoring algorithms. *Quality of Life Research, 19,* 231-241. doi: 10.1007/S11136-009-9582-Z

Fuentes, D., & Aranda, M. (2012). Depression interventions among racial and ethnic minority older adults: A systematic review across 20 years. *American Journal of Geriatric Psychiatry, 20*(11), 915-931. doi: 10.1097/JGP.0b013e31825d091a

Garrido, M. M., Kane, R. L., Kaas, M., & Kane, R. A. (2011). Use of mental health care by community-dwelling older adults. *Journal of the American Geriatrics Society*, *59*(1), 50-56.

Gitlin, L. N., Harris, L. F., McCoy, M., Chernett, N. L., Jutkowitz, E., & Pizzi, L. T. (2012). A community-integrated home based depression intervention for older African Americans: Description of the Beat the Blues randomized trial and intervention costs. *BMC geriatrics*, *12*(4), 1-11.

Glanz, K., Rimer, B. K., & Viswanath, K. (Eds.). (2008). *Health behavior and health education: Theory, research, and practice (4th ed.)*. San Francisco, CA: Jossey-Bass.

Gonzalez, J. M., Applewhite, S. R., & Barrera, I. (2015). Older Mexican Americans: Pathways to mental health service use. *Social Work in Mental Health*, *13*(4), 390-414. doi: 10.1080/15332985.2014.927813

Guerrero, N., de Leon, M., Carlos, F., Evans, D. A., & Jacobs, E. A. (2015). Determinants of trust in health care in an older population. *Journal of the American Geriatrics Society*, *63*(3), 553-557.

Guzman, E. D., Woods-Giscombe, C. L., & Beeber, L. S. (2015). Barriers and facilitators of Hispanic older adult mental health service utilization in the USA. *Issues in Mental Health Nursing*, *36*(1), 11-20.

Health Resources and Services Administration. (n.d.). *Area health recourse files (AHRF): National, state and county health resources information databases*. Retrieved from http://ahrf.hrsa.gov/

Health Resources and Services Administration. (2014). *User documentation for the county Area Health Resources File (AHRF) 2013-2014 release*. Retrieved from http://ahrf.hrsa.gov/download.htm

Hochhausen, L., Le, H., & Perry, D. (2011). Community-based mental health service utilization among low-income Latina immigrants. *Community Mental Health Journal, 47*(1), 14-23. doi:10.1007/s10597-009-9253-0

Holden, K., McGregor, B., Thandi, P., Fresh, E., Sheats, K., Belton, A.,…Satcher, D. (2014). Toward culturally centered integrative care for addressing mental health disparities among ethnic minorities. *Psychological Services, 11*(4), 357-368. doi: 10.1037/a0038122

Institute of Medicine. (2012). *The mental health and substance use workforce for older adults: In whose hands?* Washington, DC: The National Academies Press.

Jimenez, D., Alegrıa, M., Chen, C., Chan, D., & Laderman, M. (2010). Prevalence of psychiatric illnesses in older ethnic minority adults. *Journal of the American Geriatrics Society, 58*(2), 256-264. doi: 10.1111/j.1532-5415.2009.02685.x

Jimenez, D. E., Bartels, S. J., Cardenas, V., Dhaliwal, S. S., & Alegría, M. (2012). Cultural beliefs and mental health treatment preferences of ethnically diverse older adult consumers in primary care. *The American Journal of Geriatric Psychiatry*, *20*(6), 533-542.

Jimenez, D., Cook, B., Bartels, S., & Alegría, M. (2013). Disparities in mental health service use of racial and ethnic minority elderly adults. *Journal of the American Geriatrics Society, 61*(1), 18-25. doi: 10.1111/jgs.12063

Julien, D., Richard, L., Gauvin, L., & Kestens. (2012). Neighborhood characteristics and depressive mood among older adults: An integrative review. *International Psychogeriatrics, 24*(8), 1207-1225. doi:10.1017/S1041610211002894

Kaiser Family Foundation. (2014). *Medicare Advantage: Fact sheet*. Retrieved from https://kaiserfamilyfoundation.files.wordpress.com/2014/05/2052-18-medicare-advantage.pdf

Kaskie, B., Gilder, R., & Gregory, D. (2008). Community mental health service use by older adults in California. *Aging & Mental Health, 12*(1), 134-143. doi: 10.1080/13607860801942761

Kessler, E. M., Agines, S., & Bowen, C. E. (2015). Attitudes towards seeking mental health services among older adults: Personal and contextual correlates. *Aging & mental health, 19*(2), 182-191.

Kessler, R. C., Andrews, G., Colpe, L. J., Hiripi, E., Mroczek, D. K., Normand, S. L., Walters, E. E., & Zaslavsky, A. M. (2002). Short screening scales to monitor population prevalence and trends in non-specific psychological distress. *Psychological Medicine, 32,* 959-976. doi: 10.1017/S0033291702006074

Kessler, R. C., Heeringa, S., Lakoma, M. D., Petukhova, M., Rupp, A. E., Schoenbaum, M., ... & Zaslavsky, A. M. (2008). Individual and societal effects of mental disorders on earnings in the United States: Results from the national comorbidity survey replication. *American Journal of Psychiatry*, *165*(6), 703-711.

Kessler, R. C., Green, J. G., Gruber, M. J., Sampson, N. A., Bromet, E., Cuitan, M., ... & Zaslavsky, A. M. (2010). Screening for serious mental illness in the general population with the K6 screening scale: Results from the WHO World Mental

Health (WMH) survey initiative. *International Journal of Methods in Psychiatric Research, 19*(S1), 4-22. doi: 10.1002/mpr.310

Kim, G., Jang, Y., Chiriboga, D. A., Ma, G. X., & Schonfeld, L. (2010). Factors associated with mental health service use in Latino and Asian immigrant elders. *Aging & Mental Health, 14*(5), 535-542. doi: 10.1080/13607860903311758

Kim, G., Parton, J. M., DeCoster, J., Bryant, A. N., Ford, K. L., & Parmelee, P. (2013). Regional variation of racial disparities in mental health service use among older adults. *The Gerontologist, 53*(4), 618-626. doi:10.1093/geront/gns107

Kline, R. B. (2011). *Principles and practice of structural equation modeling* (3rd ed.). New York, NY: The Guilford Press.

Koizumi, N., Rothbard, A. B., Smith, T. E., & Mayer, J. D. (2011). Communities of color? Client-to-client racial concordance in the selection of mental health programs for Caucasians and African Americans. *Health care management science, 14*(4), 314-323.

Mackenzie, C., Pagura, J., & Sareen, J. (2010). Correlates of perceived need for and use of mental health services by older adults in the Collaborative Psychiatric Epidemiology Surveys. *American Journal of Geriatric Psychiatry, 18*(12), 1103-1115. doi: 10.1097/JGP.0b013e3181dd1c06

Medicare Rights Center. (2015). *Original Medicare with a Medigap vs. Medicare Advantage.* Retrieved from http://www.medicarerights.org/fliers/Medigaps/Medigaps-vs.-Medicare-Advantage.pdf?nrd=1

Miller, B. F., Petterson, S., Burke, B. T., Phillips Jr, R. L., & Green, L. A. (2014). Proximity of providers: Colocating behavioral health and primary care and the prospects for an integrated workforce. *American Psychologist*, *69*(4), 443-451.

Nadeem, E., Lange, J. M., & Miranda, J. (2008). Mental health care preferences among low-income and minority women. *Archives of Women's Mental Health*, *11*(2), 93-102. doi: 10.1007/s00737-008-0002-0

National Alliance on Mental Illness. (2006). *Mental illness facts*. Retrieved from http://www2.nami.org/gtsTemplate.cfm?Section=Newsroom&Template=/ContentManagement/ContentDisplay.cfm&ContentID=31161

National Alliance on Mental Illness. (2009*). Depression in older persons fact sheet*. Retrieved from http://www.nami.org/Template.cfm?Section=By_Illness&template=/ContentManagement/ContentDisplay.cfm&ContentID=7515

National Alliance on Mental Illness. (2013*). Alcohol and mental illness: Fact sheet.* Retrieved from http://www2.nami.org/factsheets/alcohol_factsheet.pdf

National Association of Social Workers. (2009). *Social work & care coordination*. Retrieved from http://www.naswdc.org/advocacy/briefing/CareCoordinationBriefingPaper.pdf

National Association of Social Workers. (2017). *Mental health*. Retrieved from https://www.socialworkers.org/pressroom/features/issue/mental.asp

Neighbors, H. W., Woodward, A. T., Bullard, K. M., Ford, B. C., Taylor, R. J., & Jackson, J. S. (2008). Mental health service use among older African Americans:

The National Survey of American Life. *The American Journal of Geriatric Psychiatry*, *16*(12), 948-956.

Nguyen, D., Shibusawa, T. & Chen, M. T. (2012). The evolution of community mental health services in Asian American Communities. *Clinical Social Work Journal, 40,* 134-143. doi:10.1007/s10615-011-0356-z

Ojeda, V. D., & McGuire, T. G. (2006). Gender and racial/ethnic differences in use of outpatient mental health and substance use services by depressed adults. *Psychiatric Quarterly*, *77*(3), 211-222. doi:10.1007/s11126-006-9008-9

Padgett, D. K., Patrick, C., Burns, B. J., & Schlesinger, H. J. (1994). Ethnicity and the use of outpatient mental health services in a national insured population. *American Journal of Public Health, 84*(2), 222-226.

Parcesepe, A. M., & Cabassa, L. J. (2013). Public stigma of mental illness in the United States: A systematic literature review. *Administration and Policy in Mental Health and Mental Health Services Research*, *40*(5), 384-399.

Parsons, V., Moriarity, C., Jonas, K., Moore, T., Davis, K., & Tompkins, L. (2014). Design and estimation for the National Health Interview Survey, 2006–2015. *Vital and Health Statistics, 2*(165). Hyattsville, MD: National Center for Health Statistics.

Petterson, S., Miller, B. F., Payne-Murphy, J. C., & Phillips Jr, R. L. (2014). Mental health treatment in the primary care setting: Patterns and pathways. *Families, Systems, & Health*, *32*(2), 157.

Quijano, L. M., Stanley, M. A., Petersen, N. J., Casado, B. L., Steinberg, E. H., Cully, J. A., & Wilson, N. L. (2007). Healthy IDEAS A depression intervention delivered

by community-based case managers serving older adults. *Journal of Applied Gerontology, 26*(2), 139-156.

Roehrig, C. (2016). Mental disorders top the list of the most costly conditions in the United States: $201 Billion. *Health Affairs, 35*(6), 1-6. doi: 10.1377/hlthaff.2015.1659

Rosenstock, I. M. (1974). The Health Belief Model and preventive health behavior. *Health Education Monographs, 2*(4), 354-386.

Roth, B. J., & Allard, S. W. (2016). (Re) Defining access to Latino immigrant-serving organizations: Evidence from Los Angeles, Chicago, and Washington, DC. *Journal of the Society for Social Work and Research, 7*(4), 729-753.

Rozario, P. A., & DeRienzis, D. (2008). Familism beliefs and psychological distress among African American women caregivers. *The Gerontologist, 48*(6), 772-780.

Singh, G. (2003). Area deprivation and widening inequalities in US mortality, 1969-1998. *American Journal of Public Health, 93*(7), 1137-1143. doi:10.2105/AJPH.93.7.1137

Sorkin, D. H., Murphy, M., Nguyen, H., & Biegler, K. A. (2016). Barriers to mental health care for an ethnically and racially diverse sample of older adults. *Journal of the American Geriatrics Society, 64*(10), 2138-2143.

Sorkin, D. H., Nguyen, H., & Ngo-Metzger, Q. (2011). Assessing the mental health needs and barriers to care among a diverse sample of Asian American older adults. *Journal of General Internal Medicine, 26*(6), 595-602.

Sorkin, D., Pham, E., & Ngo-Metzger, Q. (2009). Racial and ethnic differences in the mental health needs and access to care of older adults in California. *Journal of the*

American Geriatrics Society, *57*(12), 2311-2317. doi: 10.1111/j.1532-5415.2009.02573.x

Sosulski, M. R., & Woodward, A. T. (2013). African American women living with mental disorders: Factors associated with help seeking from professional services and informal supports. *Social Work in Public Health*, *28*(7), 660-671. doi:10.1080/19371918.2011.593462

Stahler, G. J., Mennis, J., Cotlar, R., & Baron, D. A. (2009). The influence of neighborhood environment on treatment continuity and rehospitalization in dually diagnosed patients discharged from acute inpatient care. *American Journal of Psychiatry*, *166*(11), 1258-1268. doi:10.1176/appi.ajp.2009.08111667

StataCorp. (2015). Stata (Version 14) [Software]. College Station, TX: Author.

Stockdale, S., Tang, L., Zhang, L., Belin, T., & Wells, K. (2007). The effects of health sector market factors and vulnerable group membership on access to alcohol, drug, and mental health care. *Health Services Research*, *42*(3), 1020-1041.

Substance Abuse and Mental Health Service Administration. (2011a). *Depression and older adults: Key issues*. Retrieved from http://store.samhsa.gov/shin/content/SMA11-4631CD-DVD/SMA11-4631CD-DVD-KeyIssues.pdf

Substance Abuse and Mental Health Service Administration. (2011b). *Leading change: A plan for SAMHSA's role and actions 2011-2014.* Retrieved from http://store.samhsa.gov/shin/content//SMA11-4629/01-FullDocument.pdf

Substance Abuse and Mental Health Service Administration. (2014). *Leading change 2.0: Advancing the behavioral health of the nation 2015-2018.* HHS Publication No. (PEP) 14-LEADCHANGE2. Rockville, MD: Author.

Substance Abuse and Mental Health Service Administration. (2016). *National Mental Health Services Survey (N-MHSS): 2014: Data on mental health treatment facilities.* HHS Publication No. (SMA) 16-5000. Rockville, MD: Author.

U.S. Census Bureau. (2014). *65+ in the United States: 2010* (Current Population Reports P23-212). Washington, DC: U.S. Government Printing Office.

U.S. Department Health and Human Services. (n.d.). *Health insurance and mental health services*. Retrieved from https://www.mentalhealth.gov/get-help/health-insurance/

U.S. Department Health and Human Services. (2017). *Healthy People 2020: 2020 topics and objectives*. Retrieved from https://www.healthypeople.gov/2020/topics-objectives

Villatoro, A. P., Morales, E. S., & Mays, V. M. (2014). Family culture in mental health help-seeking and utilization in a nationally representative sample of Latinos in the United States: The NLAAS. *The American Journal of Orthopsychiatry*, *84*(4), 353-363. doi:10.1037/h0099844

Wanchek, T. N., McGarvey, E. L., Leon-Verdin, M., & Bonnie, R. J. (2011). The effect of community mental health services on hospitalization rates in Virginia. *Psychiatric Services, 62*(2), 194-199. doi:10.1176/appi.ps.62.2.194

Ware, J. E., Kosinski, M., Bjorner, J. B., Turner-Bowker, D. M., Gandek, B., & Maruish, M. E. (2007). *User's manual for the SF-36v2 Health Survey* (2nd ed.). Lincoln, RI: QualityMetric Incorporated.

Ware, J., Kosinski, M., & Keller, S. (1996). A 12-item short-form health survey: Construction of scales and preliminary tests of reliability and validity. *Medical Care, 34,* 220-233.

Wei, W., Sambamoorthi, U., Olfson, M., Walkup, J. T., & Crystal, S. (2005). Use of psychotherapy for depression in older adults. *American Journal of Psychiatry, 162*(4), 711-717.

White, S. (2008). *Assessing the Nation's health literacy. Key concepts and findings of the National Assessment of Adult Literacy*. Chicago, IL: American Medical Association.

Woodward, A. T. (2011). Discrimination and help-seeking: Use of professional services and informal support among African Americans, black Caribbeans, and non-Hispanic whites with a mental disorder. *Race and Social Problems*, *3*(3), 146-159.