THE PATTERNS OF PHYSICAL AND BEHAVIORAL HEALTH AMONG OLDER ADULTS AND ITS EFFECTS ON OLDER MENTAL HEALTH SERVICE USE: AGE COHORT EFFECTS

By

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ABSTRACT

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With increased longevity in the United States, the proportion of older adults living with multiple chronic conditions (MCC) also increases. As the large segment of baby boomers enters an older population, healthcare concerns for older adults have expanded, including not only physical but also behavioral health conditions. The lack of chronic health care for older patients with MCC is an urgent social need. In identifying the overall health conditions among older Americans, this study aims to provide a better understanding of older people's complex healthcare needs, examine the relationship between their perceived healthcare needs and help-seeking healthcare efforts, and suggest a better way to define chronic and comprehensive health care in old age.

The study data were derived from national survey data, *Midlife in the United States Wave Three (MIDUS III)*, and a total of 2,019 respondents aged 50 years or more were used for this study analysis. To identify their health profiles, 10 health indicators including physical and behavioral health conditions were assessed: heart disease, cancer, respiratory disease, diabetes, lung disease, kidney disease, depression or anxiety, daily drinking, and heavy drinking. The baby boomers' health conditions were compared to the pre-boomers' health conditions to examine whether there is a cohort difference in older populations. The relationship between older people's health profiles and their mental health service use and how the relationship might be modified by the age cohort were examined. Latent class analysis, multinomial logistic regression, and logistic regression were conducted using Stata SE 12 version or Mplus 7.4 version for the study analyses.

The study results generated four health profiles among older Americans: Healthy, Physical MCC, Physical and Mental MCC, and Physical and Drinking MCC. When including both behavioral and physical health, the baby boomers were healthier than the pre-boomers: All three MCC groups showed higher proportions of pre-boomers than aging baby boomers while the healthy group was more associated with baby boomers. Older adults with physical MCC or physical and mental MCC were more likely to receive mental health care than the healthy people, but not those with physical and drinking MCC. The relationships between older individuals' health profiles and their mental health service use were not different between those of the aging baby boomers and the pre-boomers.

This study highlights the existence of heterogeneity in older Americans' health profiles. Particularly, physical-mental comorbidity and problem drinking among community-dwelling older adults with MCC require attention. Because of the continuous, growing aging older population, the current geriatric healthcare systems should reflect the older individuals' complex healthcare needs, which can reduce the personal burden and public spending by providing effective healthcare services and increase the quality of life for older patients with MCC. More implications for social work practices and social policy are discussed. Copyright by ILAN KWON 2018

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"The Power of Vulnerability" this is the strongest belief when I come to study social work. We all have own vulnerability. I used to try to make up for my weakness, but that was not a good idea. Sharing my weakness, asking help to others, and working together have made me stronger with genuine humility and constant learning. In particular, I am deeply grateful to my committee: My chair Dr. Woodward for sources of profound knowledge, substantial comments on my works, step-by-step guidance and tremendous patience with my slow professional development, Dr. Freddolino for warm attitude, secured social support and wise advice, and Dr. Cho for emotional support, smooth and comfortable communication and excellent teamwork, and Dr. Zhang for generous encouragement and compliment. Most of all, I thank my family and friends for their endless support on my long journey. Looking all around, I realize how lucky I am to keep up with them in my life. I wouldn't have been as successful without all of their support. I appreciate all who have stayed with me, gave comfort and showed their sincere encouragement in my personal and professional growth. Now I wish to pass what I learned to others and act up my social work belief.

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CHAPTER 1: INTRODUCTION

Increased longevity has raised the proportion of older adults living with chronic health conditions. According to a recent report from the Centers for Disease Control and Prevention (CDC, 2013), approximately half of community-dwelling adults in the United States (about 117 million) have at least one chronic health condition, which refers to a medical condition or disease that has been lasting over one year (Anderson & Horvath, 2004). As people get older, they are more likely to have multiple chronic conditions (MCC) defined as more than two chronic conditions (the National Quality Forum, 2012). One third of people 45–64 years of age have MCC, and more than half of adults aged 65 years and older report having MCC (CDC, 2016; Ward, Schiller, & Goodman, 2014). As the number of older adults in the United States grows and longevity increases, the number of older adults with MCC is also expected to continue rising.

Despite the increased prevalence of older people with MCC in practice, there are limited research on the sociodemographic factors associated with MCC and effective means for improving the living conditions of older people with MCC (Tinetti, Fried, & Boyd, 2012; Vogeli et al., 2007). To date, research has found a higher prevalence of MCC among older individuals than younger counterparts (Ward et al., 2014) and among older patients in primary care compared to the general older population (Britt, Harrison, Miller, & Knox, 2008). In addition, MCC has been found to contribute to a variety of adverse health outcomes among older adults (Dunlop, Lyons, Manheim, Song, & Chang, 2004; Newman, Boudreau, Naydeck, Fied, & Harris, 2008). Older patients with MCC are challenged with accessing the many different healthcare services required for meeting their multiple healthcare needs, which increases the burden on

older individuals with MCC in managing and receiving multiple treatments to meet their healthcare needs (Laux, Kuehlein, Rosemann, & Szecsenyi, 2008). Furthermore, this challenge is also a severe social problem related to expensive healthcare costs (Gerteis et al., 2014). To reduce these individual and social burdens and improve the quality of life for older adults, more research is warranted to investigate the combination of MCC and older individuals' help-seeking efforts to manage their multiple health conditions.

Discovering common combinations of MCC and considering older patients' help-seeking attitude are essential to provide a tailored healthcare plan for older individuals who suffer from MCC. Our first task will be to explore the combinations of chronic conditions that contribute to MCC among a nationally representative sample of adults aged 50 years and older. The complex health conditions in the older age group have been growing as the large proportion of baby boomers enter the older population. The baby boom generation, defined as those born in the years 1946 to 1964, is recognized as a cohort with a greater risk for mental health problems and heavy alcohol consumption compared to earlier generations (King, Matheson, Chirina, Shankar, & Broman-Fulks, 2013; Piazza & Charles, 2006; Choi, DiNitto, & Marti, 2015; Sacco, Kuerbis, Goge, & Bucholz, 2013; Salmon & Forester, 2012). However, the majority of research on MCC focuses exclusively on physical health conditions. This study, on the other hand, aims to explore the expanded combinations of MCC including both chronic physical and behavioral health conditions.

Older adults' help-seeking behaviors toward specialty healthcare services also deserve special consideration in examining their overall healthcare behaviors. For those living with MCC, seeking help to manage the complicated healthcare plan or receiving proper healthcare services can decrease their burden and advance the quality of their life. However, many scholars

have indicated that older people tend to have more negative help-seeking attitudes than younger people, especially related to mental health care (Beecham et al., 2008; Gonzalez, Alegria, Prihoda, Copeland, & Zeber, 2011; Wang et al., 2005). Only 24% of older adults seek help for a mental health problem (Kessler et al., 2005; Wang et al., 2005). Those who do seek help are more likely to visit general practitioners or primary care physicians than mental health professionals (Husaini, Moore, & Cain, 1994; Mackenzi, Gekoski, & Knox, 2006). Indeed, the literature has reported a strong association between physical and mental health problems among older adults. Although mental health care is needed for older individuals who suffer from MCC, mental health care is rarely provided to those older patients with physical MCC in current primary care systems, which mainly focus on acute care and tend to treat each condition separately (Crowley & Kirschner, 2015; Moffat & Mercer, 2015). In these instances, physical ailments are typically given priority (Crowley & Kirschner, 2015). Even when mental health treatment is recommended by a doctor or general practitioner in primary care, the patient tends to be referred to specialty care in a different practice, which requires the patient to follow up on the referral. The expensive healthcare costs for receiving specialty mental health care and the demands for using separate, multiple healthcare services intensify the lack of mental health service use among the older adults (Karlin & Humphreys, 2007; Roll, Kennedy, Tran, & Howell, 2013).

The underlying assumption of this study is that current geriatric healthcare systems in the United States should provide chronic and comprehensive healthcare services for aging older adults with varied MCC who suffer from its adverse health consequences and reduced quality of life. First, the contemporary healthcare system has been criticized for focusing largely on acute care for single diseases, which contributes to poor quality of care and high costs for those with

chronic illness (Moffat & Mercer, 2015; Wagner, Austin, & Korff, 1996; Woltmann, Grogan-Kaylor, Perron, Georges, Kilbourne, & Bauer, 2012). The proponents for focusing on chronic disease management in primary health care suggest a number of strategies that include assessment of risk factors, detection of early diseases, a combination of pharmacological and psychological interventions, long-term follow-up with regular monitoring, and promotion of adherence to treatment (Beaglehole et al., 2008). In addition, to align with the clinical reality of MCC, chronic care should be patient-goal-oriented to maximize the health goals of individual patients who have a unique set of risks, conditions, and priorities. Patient goal-oriented health care involves ascertaining a patient's health outcome priorities and goals, identifying the diseases and other modifiable factors impeding these goals, calculating and communicating the likely effect of alternative treatments on these goals, and guiding shared decision-making informed by this information (Tinetti, Fried, & Boyd, 2012).

These ideas are encompassed in the Chronic Care Model (CCM), developed by Wagner and colleagues (Wagner, Austin, & Korff, 1996; Wagner, Davis, Schaefer, Korff, & Austin, 1999), as an alternative conceptual model to compensate for the defects of current healthcare systems. It is now one of the most widely-used frameworks in the world to guide the provision of long-term medical care for people with physical chronic conditions (WHO, 2016). The main goal of CCM is to identify and organize the components that should be changed for improving health outcomes among patients with chronic illness such as heart diseases, hypertension, and diabetes (Coleman, Austin, Brach, & Wagner, 2009). Based on the premise that a substantial portion of chronic care takes place outside of formal healthcare settings, CCM considers allencompassing environments such as active individuals with chronic conditions, proactive teams of health professionals, and informed linkages across various healthcare systems. Of central

importance to initially improve chronic care is primary care practices since they are the frontline healthcare organizations that detect and manage multiple chronic diseases when older individuals have health problems. MCC management requires a transformation in the current healthcare systems. For example, many managed care and integrated delivery systems are intent on correcting the deficiencies in current management of diseases. The core six elements of the CCM are shown in < Table 1 >.

Among the six elementary domains-clinical information systems, decision support, selfmanagement support, delivery system design, health system, and community, several components clarify why CCM is appropriate for caring for older individuals with MCC. First, older individuals with complicated healthcare needs may have difficulty in managing all treatments. A CCM approach can enhance their capability for self-management or provide facilitators to help their management. Second, older patients are more likely to visit primary healthcare settings even when they need mental health care or treatment for substance abuse. However, fragmentation among service settings is a hindrance to providing comprehensive care that meets their complicated healthcare needs. By redesigning clinical information systems and health organizational support systems, a CCM approach can strengthen integrated and collaborative health service delivery in primary healthcare settings for the aging population. Third, older adults with mental health problems can have difficulty in treatment decisionmaking. A CCM approach can support the development and implementation of a long-term treatment plan. Finally, older people may face challenges accessing community resources or technology-based information and supports. A CCM approach can link various community resources to bring into play rich information associated with healthcare needs and management.

< Table 1 > Key Components and Strategies of Chronic Care Model (CCM)

Domain	Objective/description	Strategies
Community	Mobilize community resources to meet needs of patients	 Encourage patients to participate in effective community programs Form partnerships with community organizations to support and develop interventions that fill gaps in needed services Advocate for policies to improve patient care*
Health system	Create a culture, organization and mechanisms that promote safe, high quality care	 Visibly support improvement at all levels of the organization, beginning with the senior leader Promote effective improvement strategies aimed at comprehensive system change Encourage open and systematic handling of errors and quality problems to improve care* Provide incentives based on quality of care Develop agreements that facilitate care coordination within and across organizations
Delivery system design	Assure the delivery of effective, efficient clinical care and self-management support	 Define roles and distribute tasks among team members Use planned interactions to support evidence-based care Provide clinical case management services for complex patients* Ensure regular follow-up by the care team Give care that patients understand and that fits with their cultural background*
Self-management support	Empower and prepare patients to manage their health and health care	 Emphasize the patient's central role in managing their health Use effective self-management support strategies that include assessment, goal-setting, action planning, problem-solving and follow-up Organize internal and community resources to provide ongoing self-management support to patient
Decision support	Promote clinical care that is consistent with scientific evidence and patient preferences	 Embed evidence-based guidelines into daily clinical practice Share evidence-based guidelines and information with patients to encourage their participation Use proven provider education methods Integrate specialist expertise and primary care
Clinical information systems	Organize patient and population data to facilitate efficient and effective care	 Provide timely reminders for providers and patients Identify relevant subpopulations for proactive care Facilitate individual patient care planning Share information with patients and providers to coordinate care* Monitor performance of practice team and care system

* strategies that were added to the original CCM after 2003 revision

Source: Adapted from "Improving Chronic Illness Care" (http://www.improvingchroniccare.org/index.php?p=The_Chronic_Care_Model&s=2) Given these potential areas of influence, the CCM model shapes the development of research questions, literature review, and ultimately analysis and interpretation of results in this study.

Concerning chronic physical and behavioral health conditions together in the older population, this study proposes that the current CCM can expand the scope of healthcare services by establishing an integrated care team within primary care systems. As depicted in < Figure 1 >, the integrated care team can help older patients with MCC to manage their multiple healthcare treatments effectively and play the role as a bridge between primary care and specialty healthcare systems. For example, older individuals who suffer from mental health problems in addition to their physical health conditions may have hardships in accessing a special care system. Or professional mental health services may not fully understand the older individuals' overall healthcare concerns. The integrated care team can support both older individuals' complex healthcare needs and smooth the care transition or coordination between different healthcare systems. In doing so, the Integrated CCM will improve the overall health outcomes as well as the quality of life among older individuals with chronic physical and behavioral health conditions.

Considering the potential variety in the MCC types across the different age cohorts, the provision of adequate healthcare services for older adults with MCC is urgently needed. As a major proponent of the Integrated CCM, this study will examine ways in which groupings of physical and behavioral health conditions are associated with older adults' use of healthcare services for managing a mental health problem. In particular, baby boomers are expected to have more physical and behavioral health problems, but they are also believed to take a more active and positive attitude toward seeking help to meet their healthcare needs than the previous older generations (Colliver, Compton, Gfroerer, & Condon, 2006; Mackenzie et al., 2006). Recent studies (Woodward, 2013; Groden, Woodward, Chatters, & Taylor, 2017) have found that baby

boomers show a wide variety of patterns to deal with their mental health concerns while preboomers mainly visit primary care facilities. The study aims to examine whether this cohort difference in using professional mental health services is evident among community-dwelling older adults with MCC and whether it affects service use associated with their health conditions. Based on Andersen's behavioral model of health service use, the study results will provide a better understanding of help-seeking behaviors and patterns among older adults regarding their physical and behavioral healthcare needs.

Chapter 2 provides literature reviews on the prevalence of MCC, how it is associated with overall health outcomes and quality of life in the older population, and how older adults' overall health conditions are related to their help-seeking. Chapter 3 explains the methods for this study while Chapter 4 presents the study results. The detailed evaluation and interpretation of the results, limitations, and implications are discussed in Chapter 5.



< Figure 1 > Integrated Chronic Care Model

CHAPTER 2: LITERATURE REVIEW

Multiple Chronic Conditions (MCC)

Definition and measurement. Chronic conditions are commonly defined as medical conditions lasting at least one year, which require continuing medical care and cause dysfunction in daily living (Anderson & Horvath, 2004; Goodman, Posner, Huang, Parekh, & Koh, 2013). Examples of common chronic conditions include hypertension, heart disease, arthritis, diabetes, stroke, cancer, pulmonary disorders such as chronic obstructive pulmonary disease (COPD), asthma, kidney disease, and depression (Anderson & Horvath, 2004; Goodman, et al., 2013; Hajat, Stein, & Yach, 2017; Parekh et al., 2011; Schneider, O'Donnell, & Dean, 2009).

Multiple chronic conditions (MCC) refer to the presence of two or more chronic conditions that together impact health status, function, or quality of life and require complex healthcare management, decision-making, or coordination (the National Quality Forum, 2012). There is currently no gold standard for which conditions should be included or excluded in assessments of MCC and how various chronic conditions cluster together (Hajat et al., 2017; Tinetti et al., 2012; Vogeli et al., 2007). Instead, the literature has focused on examining the prevalence of MCC by comparing individuals with two or more chronic medical conditions and those with no or one chronic condition to examine associated demographic factors and the ways in which MCC impact individual health status and quality of life (Tinetti et al., 2012; Vogeli et al., 2007; Ward et al., 2014; Wolff, Starfield, & Anderson, 2002).

The term of multimorbidity has been frequently used interchangeably with MCC in aging and health research (Fortin, Hudon, Haggerty, van den Akker, & Almirall, 2010; Hajat et al., 2017; Huntley, Johnson, Purdy, Valderas, & Salisbury, 2012; Le Reste et al., 2013; Marengoni,

et al., 2011; Salive, 2013; Tinetti et al., 2012). Nearly the same as MCC, multimorbidity is defined as any co-occurrence of two or more chronic conditions in the same individuals; however, it does not matter whether a condition is acute or chronic (Marengoni et al., 2011) or associated with biopsychosocial factors or somatic risk factors (Le Reste et al., 2013).

Despite variation in the operational definitions in both MCC and multimorbidity, numerous aging studies have found that both are associated with cumulative, negative health outcomes and decreasing quality of life, and both require medical and social care for the complex health problems in older individuals (Le Reste et al., 2013; Marengoni et al., 2011; Tinetti, Fried, & Boyd, 2012). For this study, the term "MCC" is used, although the literature reviewed includes studies that use both "MCC" and "multimorbidity."

Prevalence. Increased longevity has increased the proportion of people who live with MCC. To track the health status, healthcare access, and progress of noninstitutionalized people in the United States, the Centers for Disease Control and Prevention [CDC] has administered the National Health Interview Survey (NHIS) since 1957 (CDC, 2018). In NHIS, the respondents are asked to indicate their health conditions among 10 physical chronic conditions (i.e., hypertension, coronary heart disease, stroke, diabetes, cancer, arthritis, hepatitis, weak or failing kidneys, current asthma, or COPD), which are selected from a list of 20 chronic conditions identified by the Health and Human Services (HHS) Department (CDC, 2018; HHS, 2010). According to a 2012 report (Ward, Schiller, & Goodman, 2014), the proportion of adults with at least two chronic conditions continuously increased and approximately one in four U.S. adults had MCC in 2010. Among the adults with at least one chronic condition, more than half had MCC. The report also showed that the prevalence of MCC increased with age. In the middle-age group (between 45 and 64 years of age), about two thirds had at least one chronic condition and

one third had MCC, while among those aged 65 years and older, 86% had at least one chronic condition and more than the half (61%) had MCC. A 2016 report found that MCC among those over 65 years of age increased from 55.4% in 2002 to 61.6% in 2015 (CDC, 2016).

However, the prevalence estimates for MCC in the aging population can vary depending on which conditions are included, how many chronic conditions are included in the count, under which circumstances it is assessed, or how it is measured. Among older people aged 65 years and over in the United States, for example, the prevalence of MCC was 61% when people were given the health checklist including only physical chronic conditions (Ward et al., 2014), but the prevalence of MCC increased up to 80% when they were given the checklist including mental health conditions such as mood disorders, depression, and anxiety disorders (Gerteis et al., 2014). When counting MCC as having two or more conditions, 83.2% of older Australian aged 75 years or more had MCC, while 58.2% had MCC with three or more conditions (Britt, Harrison, Miller, & Knox, 2008). In addition, the prevalence of MCC can be higher among older adults in primary care than those in the general population. In a systematic review study, the prevalence of MCC ranged from 13.1% to 71.8% in the general population and from 3.5% to 98.5% in primary care (Fortin, Stewart, Poitras, Almirall, & Maddocks, 2012). Even in the primary care setting, the prevalence of MCC can vary according to the way it is measured. A Swedish study that used medical records, based on a complete clinical examination by physicians, found that 55% of the older participants aged 77 to 100 years (mean, 84.6 years) had MCC and that the median number of diseases among those with MCC was 3 (Marengoni, Winblad, Kard, & Fratiglioni, 2008). Meanwhile, an Australian study using a survey, including the patient's self-report and the general practitioner's medical record, revealed that 83.2% of

older patients aged 75 years and over had MCC and more than half had morbidity in three or more domains (Britt, Harrison, Miller, & Knox, 2008).

Despite the variation in methods assessing MCC, all studies emphasize the high prevalence of MCC in the aging population, suggesting the substantial burden as well as expensive healthcare cost among individuals with MCC.

Negative impacts on health outcomes. Existing research has found that the incidence of MCC is negatively associated with functional limitation, self-rated health, and mortality. Compared to healthy older people, individuals with MCC have more functional limitations, more physical limitations (i.e., inability or avoidance of walking, climbing stairs without resting, pulling or pushing large objects, and lifting or carrying weights), and more difficulties with the Activities of Daily Living (ADL) (i.e., dressing, toileting, bathing, eating, walking across a room, and transferring in and out of bed) or Instrumental Activities of Daily Living (IADL) (i.e., hot meal preparation, shopping, using the telephone, taking medication, or managing money) (Dunlop, Lyons, Manheim, Song, & Chang, 2004). For example, research by Dunlop et al. (2004) showed that older people with chronic heart disease and arthritis (15.4%) reported the ADL limitations three times more than the general population (4.7%). In addition, 21% of healthy respondents to the Health and Retirement Study (HRS) reported functional limitations, compared to 32% of those with only heart disease and 60% of those with heart disease and other chronic illnesses (Dunlop et al., 2004).

Older adults with MCC also tend to perceive their overall health condition as worse than healthy people (Galenkamp et al., 2011; Kadam & Croft, 2007). When using a single item measure of overall health condition in older adults, low self-rated health has been associated with a greater number of chronic diseases. In particular, 24% of older patients with MCC reported

their overall physical health status as poor (Kadam & Croft, 2007). In addition, self-rated health declined at two points — when the first disease occurred and when MCC occurred — suggesting that perceptions of health status may qualitatively shift as the number of chronic conditions increases (Galenkamp et al., 2011).

Multiple chronic conditions are also associated with increased risk of mortality. Compared to older adults over 65 years of age who have no or up to two chronic medical conditions, those with 7 and more conditions had a 3.80 higher hazard ratio for mortality after one year (Newman, Boudreau, Naydeck, Fied, & Harris, 2008). In addition, among 50,000 older Americans who enrolled in fee-for-service Medicare parts A and B, those with ongoing comorbidity showed a lower survival ratio after controlling for demographic characteristics (Wang et al., 2009). These results demonstrate that MCC restrict physical and daily functioning, deteriorate overall health status, and accelerate the risk of death in older adults.

Challenges in caring for individuals with MCC. Having MCC makes it challenging for older patients to participate effectively in their own care. Persons with MCC tend to visit healthcare services more frequently, use a greater variety of services, and take more medications. Keeping track of numerous medical appointments with various providers and taking each medication with its own special instructions can make it more difficult for older individuals with MCC to manage their health care. Furthermore, there is a dearth of clinical practice guidelines for older patients with MCC. Although more than half of older Americans had three or more chronic diseases, most current clinical practice guidelines in the United States provide standards for managing single diseases (Boyd et al., 2005). A lack of awareness of adverse drug-drug interactions among older patients who take multiple medications is particularly challenging. Given that the number of chronic conditions is strongly associated with the number of different

prescriptions, referrals, and visits to primary care among older people, older patients with MCC are more likely to have difficulties understanding and reconciling the instructions of different care providers (Laux, Kuehlein, Rosemann, & Szecsenyi, 2008). Although older patients with MCC are willing to learn self-management of multiple diseases, general practitioners and other healthcare service providers are less likely to make a great effort to educate those older adults (Noël et al., 2007).

Another challenge is expensive healthcare costs for older individuals having MCC. Persons with MCC have complex health needs and, therefore. need more healthcare services than those without chronic conditions. Although Medicare or other public supplemental insurances largely cover older adults' healthcare utilization and costs, out-of-pocket healthcare spending also increases with the number of chronic conditions. Compared to individuals without any chronic conditions, the average annual out-of-pocket expenditure was 3.7 times more for those with two chronic conditions, 4.8 times more for those with three conditions, and 7.5 times more for those with five conditions (Friedman, Jiang, Elixhauser, & Segal, 2006; Gerteis et al., 2014; Paez et al., 2009). This was true for all services, including inpatient treatment, outpatient treatments, and medication costs (Paez et al 2009). With the Medicare Private Fee-For-Service, Medicare beneficiaries can have their choice of doctors, hospitals, and other providers, pay deductibles and coinsurance, while paying a monthly premium (CMS, n.d.). However, because services are unbundled and paid for separately, patients with MCC who use more services make more payments than those without. Overall, therefore, older adults with MCC experience more out-of-pocket burden for health care.

The substantial costs for managing MCC are also difficult for federal healthcare policies and programs. Treatments for chronic conditions comprise up to 86% of all healthcare

expenditures in the United States and 71% of the healthcare spending for those with MCC (Gerteis et al., 2014). Compared to individuals without any chronic conditions, the average healthcare spending per capita is 2.5 times more for those with one chronic condition and nearly 6 times more for those with three or more chronic conditions. In addition, Medicare spending for post-acute care provided after patients are discharged from the hospital has grown as the number of chronic conditions has increased over the last decade (CMS, 2012), suggesting that chronic conditions further complicate recovery from acute health events. These services include care provided in skilled nursing facilities, long-term care, inpatient rehabilitation facilities, and inhome heath care.

The burden of expensive healthcare costs is associated with a lack of comprehensive healthcare systems that are structured to meet the complex needs of older individuals with MCC. While older patients with MCC are more likely to receive a referral to secondary care services (Laux et al., 2008; Starfield, Lemke, Herbert, Pavlovich, & Anderson, 2005), those services tend to be highly specialized, duplicative, and fragmented focusing on individual diseases rather than comorbidity (Barnett et al 2012). Consequently, the high rates of primary and secondary consultations or unplanned hospital admissions raise the patient's treatment burden and furthermore prevent access to high-quality health care (Boult et al., 2011).

Gap of current MCC research. Although research to date has revealed negative impacts of MCC on health outcomes, care management, and healthcare costs, less is known about specific combinations of chronic conditions and their risk factor relationships. Some chronic diseases occur together more frequently such as high cholesterol and high blood pressure (CMS, 2012), heart disease and diabetes (LeBreton, 2015), and stroke and diabetes (Hajat et al., 2017). Some chronic conditions can play as a key risk factor to others. For example, diabetes increases

the risk of both hypertension and stroke (Barrett-Connor & Khaw, 1988), and the diabetesrelated mortality rate continues to increase (Stetson, McDonough, & Mokshagundam, 2015). Furthermore, some chronic conditions are known to have mental health sequelae such as the risk of depression during stroke recovery (Hackett, Yapa, Parag, & Anderson, 2005) and depression accompanied by diabetes (Anderson, Freedland, Clouse, & Lustman, 2001). Despite these comorbid relationships, less attention has been paid to MCC of both physical and behavioral health conditions.

Several studies on aging have reported a strong association between physical and mental health conditions (Barnett et al., 2012; Dunlop et al., 2004; Hajat et al., 2017; Marengoni et al., 2008), but few MCC studies include mental health conditions. One in five adults aged 55 years or older has reported experiencing mental health problems such as depression and anxiety in their lifetime (CDC, 2014), and a recent systematic review revealed that depression is the fourth leading cause of death among adults age 65 years and over (Lapierre et al., 2011). Untreated depression is directly associated with suicide in the older population (Fiske, Wetherell, & Gatz, 2009). Despite the severity of mental health problems in old age, mental health conditions are frequently excluded in assessing the MCC in the older population (Ward et al., 2014). The MCC prevalence rates among U.S. older adults is likely to be higher than the current results if mental health conditions were included in the MCC criteria.

Physical-mental comorbidity is common in older adults, and in particular more prevalent among those with more physical disorders (Barnett et al 2012) and community-dwelling older adults with both substance/alcohol abuse and mental health problems (Lin, Zhang, Leung, & Clark, 2011). Alcohol use disorder, including alcohol abuse and dependence, among older adults are of important concern to older people's health consequences. Estimates of the prevalence of

alcoholism among older adults vary substantially across studies due to lack of perceived diagnosis by clinicians or misidentification (Menninger, 2002). However, between 6% and 16% of community-dwelling older adults are reported to be at risk of heavy drinking, defined as having more than one standard drink per day or have three or more drinks in a single occasion (Babaturnde et al., 2014).

Heavy drinking in old age is related to not only loneliness and social isolation but also medical problems such as chronic pain and dementia (Han, Gfroerer, Colliver, & Penne, 2009). Given that approximately 90% of older adults use prescription and over-the-counter medications, heavy drinkers are at increased risk for adverse medication interactions (Han et al., 2009). Among community-dwelling older adults, individuals who had both substance/alcohol abuse and mental health problems showed higher risks for chronic physical conditions than their counterparts (Lin, Zhang, Leung, & Clark, 2011).

Moreover, the combination of physical chronic conditions and co-occurring mental health and alcohol misuse problems can cause serious damage. Several studies have reported a strong association between mental health problems and alcohol/substance abuse in the older population (Choi, DiNitto, & Marti, 2014; Salmon & Forester, 2012). According to a Substance Abuse and Mental Health Services Administration's report (SAMHSA, 2012), approximately 20% of older adults who have mental illness meet the criteria for substance dependence or abuse, and about 40% of those with substance dependence or abuse issues also report having mental illness.

Based on this evidence, the present study will examine older Americans' MCC including mental health conditions and drinking patterns. The result of MCC patterns involving physical and behavioral health conditions among older individuals will help U.S. geriatric healthcare

service providers to better understand older adults' overall healthcare needs and apply a standard to satisfy their heterogeneously complex needs.

Aging Baby Boomers

Baby boomers' health trends. As of 2014, people aged 50–68 years belong to the baby boomer generation (those born between 1946 and 1964) and those aged 69 years or older are defined as the pre-boomer generation (those born before 1946). Recent literature on aging intimates a need to distinguish between demographic and medical characteristics in the wide range of the older populations (King, Matherson, Chirina, Shankar, & Broman-Fulks, 2013; Ward, Schiller, & Goodman, 2014). The literature has found inconsistent results on aging baby boomers' overall health outcomes. While significant advances in medicine and technology have led to an increased life expectancy among baby boomers in the United States (Barasaba, 2017; Martin et al., 2009; Rice et al., 2004; Sturm et al., 2004; Zapolsky, 2004), they also suffer from more chronic diseases and disabilities than the past generation at the same age. Baby boomers have poorer overall health status and are more likely to have diabetes, hypertension, hypercholesterolemia, and obesity. In particular, the proportion of baby boomers with hypercholesterolemia was more than double that of the previous generation (King et al 2013). This is often attributed to lifestyle choices such as poor diet, physical inactivity, and stress (King et al., 2013; Trust for America's Health, 2012).

For example, obesity is one factor increasing the risk of physical and cognitive disability as well as chronic conditions including cardiovascular disease, hypertension, diabetes, high cholesterol, cancer, liver disease and other ailments (Ahima & Lazar, 2013; Houston, Nicklas, & Zizza, 2009). Not only are obesity rates higher among baby boomers compared to the previous

generation, but boomers developed obesity at earlier ages (Leveille et al 2005). In addition, although arthritis prevalence was not different between the two birth cohorts, the relative risk of arthritis increased over time due to obesity (Leveille et al 2005).

Mortality patterns in baby boomers also differ from that of previous birth cohorts. In a study that examined mortality rates by chronic diseases such as heart disease, stroke, lung cancer, and breast cancer among older adults, the results showed that the morality rate by heart disease among later male baby boomers increased (Yang, 2008). Baby boomers' lifetime exposure to risk factors such as diet and poor nutrition, lack of physical activity, or smoking might be associated with their increased mortality.

In addition, baby boomers have higher rates of mental illness as well as alcohol and substance use compared to previous generations (Piazza & Charles, 2006). The probability of experiencing a major depressive episode or mood disorder by the age of 34 was 10 times greater in the cohort born between 1945 and 1954 than for the cohort born between 1905 and 1914 (Lewinsohn, Rohde, Seeley, & Fischer, 1993). Another study found that the rate of mental disorders such as major depressive disorder and generalized anxiety disorder was higher in cohorts born after 1940 compared with those born before 1940 (Kessler et al., 2005).

Furthermore, the literature has reported that alcohol abuse was considerably higher among people born after 1940 compared to those born before 1940 (Rice et al., 2003) and 67.3% of the baby boomer cohort showed moderate drinking compared to 37.2% of the previous generation (King et al., 2013). Based on the considerable rate of alcohol and drug abuse among baby boomers, Colliver, Compton, Gfroerer and Condon (2006) warned that the large proportion of aging baby boomers with drinking problems may result in serious health consequences for those with chronic health conditions. Among other outcomes, alcohol diminishes the effect of

different medications and adverse drug-alcohol interactions can exacerbate health conditions. In a study, approximately 67% of U.S. baby boomers were drinking alcohol beyond what is considered a moderate level by the National Institute on Alcohol Abuse and Alcoholism (NIAAA), and more than half had used analgesics daily or nearly every day for at least a month (Rider, 2006). Furthermore, according to the NIAAA, the tolerance for alcohol declines among middle-aged and older adults.

The literature to date anticipates that aging baby boomers may be in poorer health status with increased rates of physical chronic conditions, mental health concerns, and problematic alcohol consumptions than older individuals in the previous generation. In particular, the co-occurrence of mental health problems and substance use disorders among older adults is expected to increase as the baby boomers age (Gfroerer, Penne, Pemberton, & Folsom, 2003), suggesting a need to broaden our understanding of chronic illness to incorporate behavioral health. This current study will explore how these heterogeneous health conditions are present among U.S. older adults, especially comparing baby boomers with pre-boomers.

Baby boomers' help-seeking. Older adults' health care is attributable to their health conditions as well as their help-seeking attitudes or behaviors to meet their healthcare needs. The literature reports that U.S. healthcare spending by the older population has grown as baby boomers retire and place increased demand on healthcare services (Berger, Levant, McMillan, Kelleher, & Sellers, 2005; Hartman, Catlin, Lassman, Cylus, & Heffler, 2008; Robb, Haley, Becker, Polivka, & Chwa, 2003). Contrary to overall healthcare services use, many studies have indicated a lack of mental healthcare service utilization in the older population (Beecham et al., 2008; Gonzalez et al., 2011; Perlick, Hofstein, & Michael, 2010; Wang et al., 2005). These

inconsistent results question whether the baby boomers' help-seeking pattern toward overall health care is similar or different compared to the pre-boomers' pattern.

Baby boomers are considered as health-conscious consumers who actively seek useful information and affordable healthcare services in the way that differs from pre-boomers (Barasaba, 2017; Piazza & Charles, 2006). Their health-conscious attitude and proactive help-seeking are attributable to more education, financial affordability, and the availability of advanced medical technology (Babatunde et al., 2014). Evidence shows that baby boomers are more likely to use mental health services and complementary and alternative approaches to care than pre-boomers (Groden, Woodward, Chatters, & Taylor, 2017). However, there have been few empirical studies that explain baby boomers' healthcare behaviors. More research is needed to examine the relationship between baby boomers' health status and their help-seeking to meet their overall healthcare needs.

Mental Health Service Use

Lack of mental health service utilization in older populations. According to the literature, older adults are more likely to visit general practitioners or primary care physicians for mental health problems (Husaini, Moore, & Cain, 1994; Mackenzi, Gekoski, & Knox, 2006; Woodward, 2013). Despite the prevalence of behavioral health problems in the older population, roughly one third of older adults do not receive professional healthcare services such as mental health treatments or special interventions for substance abuse (CDC, 2014; Lapierre et al., 2011). This is particularly true among men (Addis & Mahalik, 2003; Uebelacker, Wang, Berglund, & Kessler, 2006), older adults who are members of underrepresented racial and ethnic groups (Jimenez et al., 2013; Ojeda & Bergstresser, 2008), and older adults with lower incomes (Nelson

& Park, 2006; Seele, Dewa, & Lee, 2007). Common barriers to receiving mental health treatment among older adults include unwillingness to ask for help (Gonzalez et al., 2011; Mackenzie et al., 2006), mistrust of service providers (Devid, 2010; Ojeda & Bergstresser, 2008), negative experiences related to mental health treatment in the past (ten Have et al., 2010), stigma related to mental illness (Conner et al., 2010a; Ojeda & Bergstresser, 2008; Schnittker, 2013), social isolation (Maulik, Eaton, & Bradshaw, 2009), and fragmentation of social service systems (Unutzer et al., 2002).

Inadequacy of mental health care among older patients with MCC. Older individuals with multiple chronic diseases may be a risk of not receiving adequate care to satisfy their complex healthcare needs, specifically mental health care. Among older patients in primary care, the combination of psychological problems with other physical diseases such as vascular diseases, arthritis, or chronic back pain was large, followed by the combination of vascular diseases and arthritis, but those with mental health problems were generally treated in general practice but did not seek other professional mental health services (Britt, Harrison, Miller, & Knox, 2008). Older patients with MCC might be less likely to receive professional mental health services because health care in primary care is focused on treatment of single diseases and mental health problems tend to receive less priority (Barnett et al., 2012).

Financial affordability associated with health insurance programs is another key predictor that determines older adults' access to and utilization of mental health services. For example, Karlin and Humphreys (2007) ascribed underuse of professional mental health services to the lack of insurance coverage. By statute, Medicare reimbursed only 50% of allowable charges for outpatient mental health treatment, compared with 80% for general ambulatory services toward physical health care. In addition to this Medicare-supported mental health service disparity,

people's unmet needs for mental health care can result from the insufficient number of physicians and mental health professionals who are willing to treat Medicaid and uninsured patients (Rothstein, 2011). Despite the demand for mental health care in the older population, the rate of their unmet needs has not been reduced. One third of older adults with mental health problems were untreated (CDC, 2014; Lapierre et al., 2011). Roll, Kennedy, Tran, and Howell's study results (2013) showed that the rate of unmet mental health care needs was five times higher among uninsured individuals than those with private insurance.

Structural fragmentation in current healthcare systems may provide a particular challenge for older adults with MCC. As previously mentioned, older patients with MCC experienced more difficulties in managing and receiving diverse healthcare services within fragmented healthcare systems between primary and secondary specialty care (Barnett at el., 2012; Laux et al., 2008). Researchers have emphasized the need for improvement in the continuity and coordination of care for older patients with MCC in primary care (Noel et al., 2005; Stanger, 2009). Additionally, they suggested that each patient might need dedicated physicians or clinicians to take responsibility for healthcare coordination in favor of quality of multiple healthcare services.

Age cohort effects on the patterns of mental healthcare service utilization. As the large segment of the aging population is occupied by baby boomers who have diverse healthcare needs and show active help-seeking attitudes to meet their complex healthcare needs, recent studies have examined the differences between baby boomers and pre-boomers. Recent research has found that the baby boom generation is more likely to use a variety of services to address their mental health care needs, including family physicians, psychiatrists, psychologists, and counselors, whereas the pre-boomer generation was more likely to visit family physicians or medical doctors alone (Woodward, 2013). A pattern of taking psychotropic medications

increased in baby boomers over time more than receiving inpatient or outpatient mental health treatments (Han, Compton, Mojtabai, Colpe, & Hughes, 2016). Similarly, baby boomers are more likely than pre-boomers to use complementary and alternative medicine (CAM) in combination with conventional mental health treatments (Groden, Woodward, Chatters, & Taylor, 2017). Furthermore, the rates of lifetime help-seeking for alcohol abuse or dependence is higher among baby boomers than pre-boomers (Sacco, Kuerbis, Goge, & Bucholz, 2013). These changes may be attributed to cohort differences in attitudes toward mental health treatments as well as the influence of recent healthcare policy changes, specifically the Mental Health Parity and Addiction Equity Act of 2008.

Theoretical Framework for Older Mental Health Service Users

Based on the reviewed literature, this study has addressed the high proportion of aging older adults with MCC who suffer from adverse health consequences and reduced quality of life. Considering the potential variety in the MCC types across the different age cohorts, the provision of adequate healthcare services for older adults with MCC is an urgent need. The CCM provides an overarching framework to think about how best to organize healthcare services to support those older adults suffering from MCC. This study uses the Andersen's behavioral model of health service use to examine how different patterns of MCC are associated with mental health care.

Behavioral model of mental health service use. The behavioral model of health service use (1995) has been used previously to examine mental health service utilization among older adults (Bruffaerts et al., 2011; Elhai, Voorhees, Ford, Min, & Frueh, 2009; Jimenez, Cook, Bartels, & Alegria, 2013; Lindamer et al., 2012; Ojeda & Bergstresser, 2008). According to this

model, individuals' decision-making to use the services is influenced by three factors: predisposing characteristics, enabling resources, and needs. *Predisposing factors* encompass demographics (e.g., age and gender) or cultural beliefs about mental health (e.g., attitudes, values, and knowledge about mental illness and mental health services). *Enabling factors* are those resources that facilitate access to services, or work as barriers when those resources are deficient. Examples include individual/family income, health insurance status, and knowledge about how and where to access services or community resources. *Need* consists of perceived and evaluated needs. *Perceived need* refers to how serious people think their condition is; it is measured by self-reported health/mental health status or restricted daily activities. *Evaluated need* refers to more objective measures such as diagnosed disorders or documented symptoms, not just self-reported conditions.

Previous studies using this behavioral model found consistent support for several predictors of mental health service use. Consistent findings among predisposing characteristics include greater mental health service use among women than men (Gonzalez, Alegria, Prihoda, Copeland, & Zeber, 2011; Mackenzie, Gekoski, & Knox, 2006), higher service use among divorced persons than married couples (Narrow et al., 2000), lower service use by racial/ethnic minority groups (Jimenez, Cook, Bartels, & Alegria, 2013; Neighbors et al., 2007), and cultural belief in mental health and mental health service use for managing mental health issues (Woodward, Chatters, Taylor, Neighbors & Jackson, 2010). Income is cited as a manifest enabling resource (Dobalian & Rivers, 2008). Others identify barriers such as lack of health insurance coverage (Karlin & Humphreys, 2007), low perceived need (Bruffaerts et al., 2011; Mackenzie, Pagura, & Sareen, 2010), stigma (Conner, Koeske & Brown, 2009; Thornicroft,

2008), and mistrust of mental health treatment (Conner et al., 2010b; Jang, Chiriboga, Herrera, Tyson, & Schonfeld, 2011; Ojeda & Bergstresser, 2008).

This dissertation sheds new light on the need factor in Andersen's model, using latent class analysis (LCA) to identify patterns of physical and behavioral disorders among older adults. As shown in < Figure 2 >, the study focuses on older individuals' characteristics including demographic and perceived needs for their health conditions. Unlike a variable-centered approach such as regression, LCA is a person-centered approach and assumes heterogeneity across the population and attempts to group individuals for whom the patterns and association between predictors and outcomes are similar (Lauresen & Hoff, 2006). As described in the previous section, the health care need of the aging population has become complicated including physical and behavioral health conditions. Compared to the previous older population, aging baby boomers may have different healthcare needs, including both physical and behavioral health conditions. In addition to individuals' demographic and health characteristics, the Andersen model emphasizes the importance of social healthcare systems in the community consistent with the integrated CCM.


< Figure 2 > Behavioral Model of Mental Health Services Use

Research Questions and Hypotheses

Based on the reviewed literature on MCC among older adults, aging baby boomers' health trend and older people's patterns of mental health services use associated with their healthcare needs, four questions and relevant hypotheses were generated.

Question 1: What patterns of physical and behavioral health conditions characterize the aging population?

<u>Hypothesis 1</u>: There will be four major groupings of physical and behavioral health conditions among older adults: (1) a healthy group with limited physical or behavioral health conditions; (2) a group with physical health conditions, but few or no behavioral health conditions; (3) a group with behavioral health conditions, but few or no physical health conditions; and (4) a group with both physical and behavioral health conditions.

Question 2: How do the patterns of physical and behavioral health conditions in the older adult population vary by age cohort?

<u>Hypothesis 2</u>: Baby boomers will be more likely than pre-boomers to have behavioral health conditions and, therefore, will be more likely to belong to groups 3 and 4.

Question 3: What is the relationship between the patterns of physical and behavioral health conditions and mental health services use?

<u>Hypothesis 3-1</u>: Older individuals with either physical or behavioral health problems will use more mental health services than those who are healthy.

<u>Hypothesis 3-2</u>: Older people with behavioral health problems will use more mental health services than those with physical health problems only.

Question 4: How does age cohort moderate the association between the patterns of physical and behavioral conditions and mental health services use?

<u>Hypothesis 4</u>: Baby boomers with behavioral health problems will be more likely to use mental health services than pre-boomers with the same problem.



< Figure 3 > The Study Model

CHAPTER 3: METHOD

Study Data and Sample

This study used data from a national longitudinal study of health and well-being, *Midlife in the United States* (MIDUS). The purpose of the MIDUS study is to understand how behavioral, psychological, and social factors influence Americans' health and well-being in middle and later life. Funded by the MacArthur Foundation Research Network on Successful Midlife Development, the first-wave data (MIDUS I) was collected in 1995 and 1996. The participants were recruited via random digit dialing procedures. The criteria for eligibility included being noninstitutionalized, English-speaking adults, aged 24–74 years. The selected respondents were informed that a survey inquiring about health and well-being during the middle years of life would be delivered and that this self-administered questionnaire (SAQ) would entail a 30-minute telephone interview. To date, three additional waves of data collection have been conducted: MIDUS II (2002–2006), MIDUS Refresher (2011–2014), and MIDUS III (2013– 2014).

MIDUS was the best dataset for this study because it was the most comprehensive epidemiological data available on physical and behavioral health indicators and mental health service use among community-dwelling older adults. This dissertation used data from wave 3, the most recent data since all participants in wave 1 (collected in 1995 and 1996) entered their middle or later life: The age range for MIDUS III was 39–93 years old. Age 50 was chosen as the cutoff because it is the age of the youngest baby boomer (those born between 1946 and 1964) at the time of data collection in 2013 and 2014. Among the total 3,294 cases in MIDUS III, there were 2,925 individuals aged 50 years and older. At the time of data collection, individuals aged

50–68 years belonged to the baby boomer group and those aged 69 years or older belonged to the pre-boomer group (born in 1945 or earlier).

The analytic sample for this study includes respondents who answered all questions related to the study variables using both an SAQ and telephone interview. Cases were excluded if the respondents did not complete the SAQ or telephone interview (n=450). The respondents who indicated they have never had a drink in their lifetime (n=201) were also excluded from this study analysis because non-drinkers may be qualitatively different from drinkers, whether they exhibit problem drinking behaviors or not. Among 2,289 eligible respondents, listwise deletion in the analysis resulted in a final study sample of 2,019 respondents. The majority of the sample was white (90%), approximately two thirds were baby boomers (63%), and half were female (53%).

Measures

The variables used in this study came from both the telephone interview and the SAQ in the MIDUS III survey.

Physical health conditions. The participants in the MIDUS III survey were asked whether they had experienced or had been treated for 40 common medical conditions during the last 12 months. Some conditions such as heart diseases and cancer were asked separately. Seven physical health conditions were included in this study analysis, based on the identification of common chronic conditions by the Department of HHS (2010) and the leading causes of older people's death reported by the CDC (as cited in Kochanek, Murphy, Xu, & Tejada-Vera, 2016), These include: 1) heart diseases, 2) cancer, 3) respiratory diseases (asthma, bronchitis, or emphysema), 4) stroke, 5) diabetes or high blood sugar levels, 6) lung diseases (tuberculosis

and/or other pulmonary problems), and 7) high blood pressure or hypertension. Questions asking about the respondents' lifetime experiences of having heart diseases or cancer were given during the telephone interview whereas other physical indicators were identified from the SAQ that inquired about the respondents' health conditions and concerns during the last 12 months. The indicator for lung diseases combined the responses to two separate questions — one for tuberculosis and one for other pulmonary problems. A "yes" response was coded as "1" and a "no" response was recoded as "0" for all physical health variables.

Behavioral health conditions. Behavioral health indicators include measures of the presence of mental health problems and problem drinking behaviors. For assessing the mental health problem, the respondents were asked in the SAQ, "In the last 12 months, have you experienced or been treated for anxiety, depression, or some other emotional disorder?" The response was coded as "1" for "yes" and "0" for "no."

Problem drinking is distinct from alcohol abuse or dependence, which are accompanied by a physical addiction to alcohol. The Institute of Medicine (1990) defined problem drinkers as people who drink heavily or experience occasional problems from drinking, but who do not have a history of severe physical dependence on alcohol. Problem drinking is a focus for this study because it is considered a risk factor to community-dwelling older adults' health conditions and is more prevalent among older adults than alcohol abuse and dependence (Walitzer & Connors, 1999; Wilson et al., 2014).

According to the National Institute on Alcohol Abuse and Alcoholism's guideline (2018), adults over the age of 65 years who are healthy and do not take medications should not have more than three drinks on any given day or more than seven drinks in a week. The NIAAA also warns that older people who have a health problem or take certain medications may need to drink

less then this or not at all. Based on these guidelines, problem drinking in this study is defined as having at least one drink every day (defined as heavy drinker) or having three or more drinks on average days when they drink (defined as binge drinking). Previous research has demonstrated that a substantial proportion of older adults who consume alcohol in middle age (between the ages of 55 and 65 years) continue to engage in excessive drinking or incur drinking problems as defined by the NIAAA in their 70s and 80s (Moos, Schutte, Brennan, & Moos, 2009). For this reason, the same criteria for problem drinking were used for both pre-boomers and baby boomers.

Problem drinking was measured using two questions. The participants were asked, "During the past month, how often did you drink any alcoholic beverages, on the average? Would you say every day, 5 or 6 days a week, 3 or 4 days a week, 1 or 2 days a week, or less often than 1 day a week?" The responses were coded as a dichotomous variable *daily drinking*, indicating "1" for drinking every day and "0" for drinking sometimes but not every day. They were also asked, "By one drink, we mean either a bottle of beer, a wine cooler, a glass of wine, a short of liquor, or a mixed drink. With this definition in mind, on the days when you drank, about how many drinks did you drink on the average?" This was an open question, and the original responses ranged from 0 to 20 at maximum. The responses having three or more drinks on average were recoded as "1," and less than three drinks as "0" to indicate *heavy drinking*.

Age group by baby boomers' birth cohort. Age was constructed as a dichotomous variable that compared baby boomers (those born between 1946 and 1964) to pre-boomers (those born before 1946). People aged 50—68 years belonged to the baby boomer group and those aged 69 years or older to the pre-boomer group in 2014 when the MIDUS III data were collected. The indicator was coded "1" for baby boomers and "0" for pre-boomers.

Mental health service use. The participants were asked "in the last twelve months, how many times did you see each of the following professionals about your emotional or mental health or personal problems, such as problems with marriage, alcohol or drugs, or job stress? Include both individual visits and group sessions regarding your problems, but not visits when you took someone else regarding their problems." Professionals included: 1) psychiatrist, 2) general practitioner or other medical doctor, 3) mental health professionals such as psychologist, professional counselor, marriage therapist, or social worker, and 4) minister, priest, rabbi, or other spiritual advisors. Overall mental health service use was coded "1" for participants who used at least one of the four groups of professionals and "0" when none of the four groups of professionals was utilized.

Control variables. Sex, race, education level, marital status, and income were treated as control variables because they are associated with key outcome variables in this study. All control variables were assessed from the phone interview. Sex was dichotomized into male and female. Race was assessed as a categorical variable, involving white, black and/or African American, Native American or Alaska native Aleutian Islander/Eskimo, Asian, native Hawaiian or Pacific Islander, and other. Because of the number of cases across the categories, race was dichotomized in this study as white and non-white. Education was measured as the highest level of education that participants completed in four categories: 1) high school graduation or less, 2) some college level, 3) college graduation, and 4) some graduate school or more. Marital status was measured as: 1) married, 2) separated or divorced, 3) widowed, and 4) never married. Income was assessed using a continuous measure of total household income including wage, pension, social security, and other resources. Since the final study dataset showed the skewness of income less than 2, which is considered acceptable for a normal univariate distribution in

many other studies (Field, 2000 & 2009; George & Mallery, 2010; Gravetter & Wallnau, 2014; Trochim & Donnelly, 2006), the intact income variable was used as raw numbers in this analysis.

Data Analyses

The analytical strategy of this study integrated variable- and person-centered statistical approaches to expand our knowledge of the patterns of physical and behavioral health in older populations and examine the relationship between those patterns and mental health services use. While a variable-centered approach (e.g., regression analysis) assumes that the population is homogeneous and examines the associations among variables, a person-centered approach (e.g., LCA) assumes that the population is heterogeneous and, therefore, examines how individuals are grouped and whether specific predictors are associated with patterns of grouping (Laursen & Hoff, 2006).

LCA was employed using Mplus version 7 (Muthén & Muthén, 2015) to test the first hypothesis that aimed to identify groups of older individuals who have a similar pattern of physical and/or behavioral health conditions. The main variables of interest were 10 dichotomous indicators of the presence of particular physical and behavioral health problems. The LCA estimation is based on maximum likelihood. Since all variables for running the LCA were binary in this study, maximum loglikelihood robust estimation (MLR) was adopted to get the LCA results (Muthén & Muthén, 2012). To estimate the best LCA model, several steps were followed. First, a basic model with 10 binary indicators was created by designating all indicators as one latent class. Second, the number of latent classes was increased until the best model was identified based on four model fit indices (Akaike Information Criterion (AIC), Bayesian Information Criterion (BIC), classification quality entropy, and Lo-Mendell-Rubin adjusted

likelihood ratio test) as well as interpretability of the classes (Muthén & Muthén, 2012). The classification quality entropy is a single value measure of the degree of uncertainty in the model, which indicates how well individuals are assigned to latent classes (Collins & Lanza, 2010). The entropy estimates range from 0 to 1, and the values close to 1 indicate that the sample individuals are well assigned to each latent class of the model. A better model reveals smaller AIC and BIC estimates, entropy closer to 1, and a p<0.05 for the Lo-Mendell-Rubin adjusted likelihood test. In addition, a rule of thumb is that each latent class includes a minimum of 3% to 4% of the total cases.

The second hypothesis was tested using multinomial logistic regression in Stata version 12 (StataCorp, 2011). The bivariate relationships between latent classes, age cohort, and control variables were examined using chi-square and Analysis of Variance (ANOVA) analyses. The multinomial logistic regression was employed to examine the variables associated with latent classes. In particular, the difference between the baby boomers and the pre-boomers was examined controlling for other demographic variables.

A logistic regression was employed to examine the association between the health profiles and mental health services use among older adults, controlling for other demographic variables (Hypothesis 3). Finally, to examine the moderating effect of age cohort on the relationship between health profiles and mental health services use (Hypothesis 4), an interaction term was created by multiplying the age cohort with the health profiles and then added to the logistic regression model.

Before all of these analyses, a missing data analysis was conducted to explore if a specific missing pattern would bias the study data results. Among the eligible study sample of 2,289 respondents, 270 cases carried at least one missing value (12% of the total study sample).

Most data were missing from income, followed by mental health services use and several health conditions that were queried in the SAQ. The bivariate comparisons between each study variable and the missing versus the non-missing pattern revealed some variables showing differences. For example, more missing cases occurred in the pre-boomers than in the baby boomers, females than males, and people having stroke or diabetes than those without these conditions. Widowed individuals and people with a high school education or less had the most missing data overall.

CHAPTER 4: RESULTS

< Table 2 > displays sample characteristics associated with all of the study variables as well as the characteristic comparison between the pre-boomers and the baby boomers. Approximately two third of the sample were baby boomers. The majority were white (90%) and married (67%) while the gender ratio was almost even. Three fourth of the sample reported having more than a high school degree. The mean income was \$86,243 (SD=71,955; median, \$67,500). High blood pressure was the most common health condition (40.27%), followed by heart disease (23.53%), cancer (23.03%), depression and/or anxiety (19.81%), diabetes (15.21%), respiratory diseases (11.54%), heavy drinking (9.56%), daily drinking (8.22%), lung diseases (4.61%), and stroke (1.14%). One of five older adults reported having visited any type of mental health services within the past year.

Comparisons between two age cohorts indicated more proportions of the married among the baby boomers and greater proportions of the widowed among the pre-boomers. Baby boomers showed a higher percentage of college graduates and even more education whereas more pre-boomers showed a higher percentage of high school graduates and less education. Moreover, the mean income was \$99,332 for baby boomers and \$63,667 for pre-boomers. Among the health conditions, only heavy drinking showed a higher proportion in baby boomers than in pre-boomers. Most health conditions, including heart disease, cancer, respiratory disease, diabetes, lung disease, high blood pressure, and daily drinking, showed a higher proportion in the pre-boomers than in the baby boomers. Both stroke and depression/anxiety did not show any difference between the two age cohorts. Approximately three fourth of the baby boomers were identified as the *Healthy* group while the pre-boomers held the higher proportions in the other

three MCC groups. There was no difference in using mental health services or receiving professional treatments for mental health care between the two age cohorts.

	Total (n=2,019)		Pre-bo	omers	Baby B	soomers		
			(n='	(n=741)		,278)	χ^2	р
	n	%	n	%	n	%	-	
Race								
White	1,822	90.24	671	90.55	1,151	90.60	0.128	0.720
Non-white	197	9.76	70	9.45	127	9.94		
Gender								
Male	953	47.20	361	48.72	592	46.32	1.080	0.299
Female	1,066	52.80	380	51.28	686	53.68		
Marital Status								
Married	1,358	67.26	444	59.92	914	71.52	157.704	0.000
Separated or divorced	299	14.81	96	12.96	203	15.88		
Widowed	239	11.84	174	23.48	65	5.09		
Never married	123	6.09	27	3.64	96	7.51		
Educational Attainment								
High school graduation or less	553	27.39	248	33.47	305	23.87	28.104	0.000
Some college	398	19.71	153	20.65	245	19.17		
College graduation	645	31.95	198	26.72	447	34.98		
Some graduate school or more	423	20.95	142	19.16	281	21.99		
	М	SD	М	SD	М	SD	F	р
Income	\$ 86,243	71,955	\$63,667	60,988	\$99,332	74,560	122.15	0.000

< Table 2 > Descriptive Characteristics and Bivariate Comparisons between Pre-boomers and Baby Boomers (n=2,019)

		Total		Pre-B	oomers	Baby E	Boomers	χ^2	р
		(n=2	,019)	(n=	741)	(n=1	,278)		
		n	%	n	%	n	%		
Heart Disease	No	1,544	76.47	483	65.18	1,061	83.02	82.955	0.000
(Lifetime)	Yes	475	23.53	258	34.82	217	16.98		
Cancer	No	1,554	76.97	486	65.59	1,068	83.57	85.548	0.000
(Lifetime)	Yes	465	23.03	255	34.41	210	16.43		
Respiratory Diseases	No	1,786	88.46	638	86.10	1,148	89.83	6.385	0.012
(Last 12 months)	Yes	233	11.54	103	13.90	130	10.17		
Stroke	No	1,996	98.86	729	98.38	1,267	99.14	2.398	0.122
(Last 12 months)	Yes	23	1.14	12	1.62	11	0.86		
Diabetes	No	1,712	84.79	576	77.73	1,136	88.89	45.276	0.000
(Last 12 months)	Yes	307	15.21	165	22.27	142	11.11		
Lung Disease	No	1,926	95.39	684	92.31	1,242	97.18	25.373	0.000
(Last 12 months)	Yes	93	4.61	57	7.69	36	2.82		
High Blood Pressure	No	1,206	59.73	379	51.15	827	64.71	35.874	0.000
(Last 12 months)	Yes	813	40.27	362	48.85	451	35.29		
Anxiety/ Depression	No	1,619	80.19	600	80.97	1,019	79.73	0.452	0.501
(Last 12 months)	Yes	400	19.81	141	19.03	259	20.27		
Daily Drinking	No	1,853	91.78	666	89.88	1,187	92.88	5.598	0.018
(Last Month)	Yes	166	8.22	75	10.12	91	7.12		
Heavy Drinking	No	1,826	90.44	708	95.55	1,118	87.48	35.299	0.000
(Last Month)	Yes	193	9.56	33	4.45	160	12.52		
Mental Health Services	No	1,626	80.53	601	81.11	1,025	80.20	0.244	0.621
(Last 12 months)	Yes	393	19.47	140	18.89	253	19.80	1	

< Table 2 > (cont'd)

Question 1: What patterns of physical and behavioral health conditions characterize the aging population?

<u>Hypothesis 1</u>: There will be four major groupings of physical and behavioral health conditions among older adults: (1) a healthy group with limited physical or behavioral health conditions; (2) a group with physical health conditions, but few or no behavioral health conditions; (3) a group with behavioral health conditions, but few or no physical health conditions; and (4) a group with both physical and behavioral health conditions.

The first hypothesis was partially supported by the LCA of these sample data. Although four latent classes were generated as expected, mental health problems and problem drinking behaviors were present with physical health problems rather than as a separate class with behavioral health problems only.

The model fit indices for each model, which examined one to five latent classes, are presented in < Table 3 > and < Table 4 >. In < Table 3 >, The Lo-Mendell-Rubin adjusted likelihood ratio test (LMR LR) was statistically significant for the 2-, 3-, and 4-class models, but not in the 5-class model. < Table 4 > shows the distribution of cases for each model. Although all of the models met the minimum requirements for the proportion of cases in each class, the 5class model was excluded for the final model due to the insignificant *p*-value of the LMR LR. Among the significant three models, the 3- and 4-class models showed larger entropy estimates than the 2-class model. The AIC and BIC declined or remained relatively stable through the 4class model but increased between the 4- and 5-class models. The BIC and entropy indicators suggests the 3-class model is a better fit. However, the LMR and AIC suggest the 4-class model fits better. Given this inconsistency the predicted probabilities for class membership were examined and the 4-class model was determined to be more easily interpretable and used for subsequent analyses.

	Class 1	Class 2	Class 3	Class 4	Class 5
AIC	17,716.990	17,404.191	17,346.307	17,290.930	17,300.027
BIC	17,774.349	17,524.645	17,529.855	17,537.572	17,609.764
Entropy		0.492	0.668	0.647	0.624
LMR LR test (<i>p</i> value)		0.0000	0.0002	0.0019	0.5136

< Table 3 > LCA Model Comparisons by the Model Fit Indices (n=2,289)

< Table 4 > Class Counts and Proportions for Latent Classes (n=2,289)

	Cla	ss 1	1 Class 2		Class 3		Class 4		Class 5	
1	2,289	1.000	547	0.239	542	0.237	119	0.052	95	0.042
2			1,742	0.761	1,607	0.702	469	0.205	322	0.141
3					140	0.061	1,529	0.668	142	0.062
4							172	0.075	1,523	0.665
5									207	0.090

Defining and naming the latent classes is also important. Individuals were assigned to the latent class corresponding to their highest probability of membership (Lanza & Rhoades, 2013). For each class, the number of respondents in that class and the probability of having each physical or behavioral health problem are reported. Conditional probabilities of 0.7 to 1 indicate

a high probability of belonging to that class, 0.4 to 0.69 is a moderate probability, and less than 0.4 is a low probability (Collins, & Lanza, 2013; Thorpe, Thorpe, Kennelty, & Pandhi, 2011) (< Table 5 > and < Figure 4 >).

Among the four groups, Group 1 showed moderate probabilities across several health indicators including heart disease, respiratory disease, lung disease, high blood pressure, and anxiety and/or depression. The probability for having cancer is just under 0.40 and this is the highest probability for cancer across all four groups. Individuals in this group have a very low probability of daily or heavy drinking. This group, therefore, is characterized by having several physical conditions in combination with anxiety and/or depression and has been labeled *Physical and Mental MCC*. This group includes 5% (n=119) of the total older population in this sample.

Individuals in Group 2 have a high probability of high blood pressure. The probability for diabetes is close to 0.40 and this group has the highest probability for diabetes across the four groups. Individuals in this group have a low probability of anxiety/depression as well as daily and heavy drinking. This group is characterized by some chronic health conditions and is labeled *Physical MCC*. Twenty percent of the sample (n=469) are assigned to this group.

Group 3 typified healthy people with a low probability of physical and behavioral health conditions. This group is labeled *Healthy* and accounts for 67% (n=1,529) of the total sample.

Finally, individuals in Group 4 drink daily and have the highest probability of heavy drinking across the four groups. In addition, they have a moderate probability of high blood pressure. This group is characterized by problematic drinking behaviors and some physical health problems and was labeled *Physical and Drinking MCC*. Approximately 8% of the total sample (n=172) was assigned to this group.

	Physical & Mental MCC (n=119, 5%)	Physical MCC (n=469, 20%)	Healthy (n=1529, 67%)	Physical & Drinking MCC (n=172, 8%)
Heart disease	0.605	0.362	0.130	0.293
Cancer	0.397	0.239	0.190	0.315
Respiratory disease	0.542	0.102	0.075	0.089
Stroke	0.067	0.030	0	0.030
Diabetes	0.348	0.378	0.047	0.091
Lung disease	0.474	0	0.021	0.009
High blood pressure	0.672	0.757	0.216	0.471
Anxiety/Depression	0.489	0.229	0.148	0.252
Daily drinking	0.053	0	0.026	1
Heavy drinking	0.059	0.040	0.097	0.330

< Table 5 > Results in Probability Scale (n=2,289)

Numbers in bold indicate high and moderate probabilities of being in each health condition with high probability ≥ 0.7 ; moderate probability between 0.4 and 0.7; and low probability < 0.4.



< Figure 4 > Four Groups of LCA Results in the Study

Question 2: How do the patterns of physical and behavioral health conditions in the older adult population vary by age cohort?

<u>Hypothesis 2</u>: Baby boomers will be more likely than pre-boomers to have behavioral health conditions with or without physical health conditions.

The second hypothesis that age cohort would influence the patterns of physical and behavioral health conditions in older people was not supported. The bivariate comparisons of the latent classes with other variables are presented in < Table 6 >. Age cohort, gender, educational level, and income were significantly associated with latent classes. The Healthy older people comprised a higher proportion of baby boomers (73.8%) than pre-boomers (55.3%), whereas more pre-boomers were in each of the other classes. A proportion of white versus non-white was not significantly different not only for people in this group but also across all classes. A higher proportion of females (68.3%) were in this *healthy* class compared to males (65.6%). Marital status did not show a significant association with the patterns of physical and behavioral health conditions. These older people had a higher average income (M=\$91,113) than the total study sample (\$86,243) as well as the group with Physical MCC (M=\$70,578) and Physical and Mental MCC (M=\$59,218), but not the group with Physical and Drinking MCC (\$101,969). Along with the high income, their proportions toward advanced educational levels showed an increasing pattern: The probability of attaining graduate school was the highest whereas the probability of completing high school or less education was the lowest.

The traits of *older people with Physical MCC* were the complete opposite of the healthy people's characteristics. The higher proportion of pre-boomers (27%) were in this group compared to baby boomers (16.1%). Their average income was less than that of the total sample

and the healthy group. The probability of belonging to this group was the highest among people who graduated from high school or attained less education, decreasing along with the advanced education level.

Among *older people with Physical and Mental MCC*, the proportion of pre-boomers (8.2%) was more than double the baby boomers (3.1%). The proportion of females (6.2%) were about twice that of males (3.7%). Similar to the group with Physical MCC, the educational levels were in inverse proportion to the number of allocated people. Noticeable is the lowest average income among all groups.

Finally, *older people with Physical and Drinking MCC* also comprised more pre-boomers (9.5%) than baby boomers (7%). The higher proportion of males (9.9%) was in this group compared to females (6.1%). The inverse relationship between the number of allocated people and educational levels was manifest in this group: The probability of attaining graduate school was the highest, whereas the probability of graduating from high school or completing less education was the lowest. This group also showed the highest average income among all groups.

< Table 7 > shows the results of multinomial logistic regression. All possible comparisons were examined, although < Table 7 > only presents the results with the *Healthy* group as the comparison group. Additional group comparisons are described in the text when significant. Consistent with the bivariate results, the baby boomers were healthier than the preboomers after controlling for other study variables. Specifically, the baby boomers were 52% less likely than the pre-boomers to belong to the group with *Physical MCC* compared to the *Healthy*, 67% less likely to belong to the group with *Physical and Mental MCC*, and 48% less likely to belong to the group with *Physical and Drinking MCC*. Females were less likely than males to belong to the group with *Physical and Drinking MCC* compared to the *Healthy* group.

In addition, females were 1.660 times more likely than males (95% CI, 1.032–2.669, p=0.037) to belong to the group with *Physical and Mental MCC* compared to *Physical MCC*.

In terms of the socioeconomic status, individuals with more education were less likely to be in the *Physical MCC* or *Physical and Mental MCC* groups compared to the *Healthy* group. However, those with graduate-level education were 2.07 times more likely than those with a high school degree or less to be in the group with *Physical and Drinking MCC*. Individuals with more income were less likely to belong to the group with *Physical MCC* compared to the *Healthy* group. Income was not significantly related to the *Physical and Mental MCC* or *Physical and Drinking MCC* groups.

	Hea (n=1	Healthy Physical MCC (n=1,353) (n=406)		Physical & Mental MCC (n=101)		Physical & Drinking MCC (n=159)		χ^2	р	
	n	%	n	%	n	%	n	%		
Age										
Pre-boomer	410	55.33	200	26.99	61	8.23	70	9.45	79.49	0.000
Baby boomer	943	73.79	206	16.12	40	3.13	89	6.96		
Race										
White	1,223	67.12	360	19.76	93	5.10	146	8.01	2.01	0.570
Non-white	130	65.99	46	23.35	8	4.06	13	6.60		
Gender										
Male	625	65.58	199	20.88	35	3.67	94	9.86	16.53	0.001
Female	728	68.29	207	19.42	66	6.19	65	6.10		
Marital Status										
Married	921	67.82	263	19.37	56	4.12	118	8.69	14.58	0.103
Separated or divorced	199	66.56	65	21.74	19	6.35	16	5.35		
Widowed	150	62.76	52	21.76	20	8.37	17	7.11		
Never married	83	67.48	26	21.14	6	4.88	8	6.50		
Educational Attainment										
High school graduation or less	342	61.84	139	25.14	45	8.14	27	4.88	50.53	0.000
Some college	264	66.33	86	21.61	20	5.03	28	7.04		
College graduation	451	69.92	117	18.14	24	3.72	53	8.22		
Some graduate school or more	296	69.98	64	15.13	12	2.84	51	12.06		
	М	SD	М	SD	М	SD	М	SD	F	р
Income	91,113	72,609	70,578	65,322	59,218	60,109	101,969	79,005	16.11 ^a	0.000 ^a

< Table 6 > Descriptive Characteristics and Bivariate Associations between Demographics and Health Profiling Groups (n=2,019)

^a In the post hoc comparisons, the Healthy group and the group with Physical and Drinking MCC were significantly different from the group with Physical MCC and Physical and Mental MCC at p<.05.

	Physical MCC			Phy	vsical & Mental	MCC	Phys	Physical & Drinking MCC		
	RRR	95% CI	р	RRR	95% CI	р	RRR	95% CI	р	
A										
Age (Due he encod)										
(Pre-boomer)	-	-	-	-	-	-	-	-	-	
Baby boomer	.482	[.378, .615]	0.000	.329	[.210, .514]	0.000	.517	[.361, .740]	0.000	
Race										
(White)	-	-	-	-	-	-	-	-	-	
Non-white	1.186	[.823, 1.709]	0.361	.786	[.368, 1.679]	0.535	.872	[.477, 1.593]	0.656	
Gender										
(Male)	-	-	-	-	-	-	-	-	-	
Female	.845	[.668, 1.069]	0.161	1.402	[.896, 2.196]	0.139	.674	[.475, .953]	0.027	
Marital Status										
(Married)	-	-	-	-	-	-	-	-	-	
Separated or divorced	1.035	[.744, 1.438]	0.840	1.300	[.733, 2.308]	0.370	.727	[.413, 1.277]	0.267	
Widowed	.794	[.546, 1.156]	0.229	1.022	[.565, 1.851]	0.942	.865	[.484, 1.545]	0.624	
Never married	1.129	[.700, 1.822]	0.619	1.350	[.548, 3.326]	0.515	.819	[.381, 1.761]	0.609	
Educational Attainment										
(High school graduation or less)	-	-	-	-	-	-	-	-	-	
Some college	.830	[.603, 1.142]	0.252	.631	[.360, 1.106]	0.108	1.374	[.787, 2.397]	0.264	
College graduation	.759	[.564, 1.021]	0.068	.548	[.320, .938]	0.028	1.479	[.899, 2.436]	0.124	
Some graduate school or more	.644	[.450, .920]	0.016	.430	[.215, .859]	0.017	2.070	[1.229, 3.486]	0.006	
		[,]			[,]			[,]		
Income	.999	[.999, .999]	0.005	.999	[.999, 1.000]	0.112	1.000	[.999, 1.000]	0.467	

< Table 7 > Multinomial Logistic Regression Results Predicting Classification of Physical and Behavioral Health Problems (n=2,019)

Healthy is the comparison group.

Question 3: What is the relationship between the patterns of physical and behavioral health conditions and mental health service use?

<u>Hypothesis 3-1</u>: Older individuals with either physical or behavioral health problems will use more mental health service than those who are healthy. <u>Hypothesis 3-2</u>: Older people with behavioral health problems will use more mental health services than those with only physical health problems.

The third hypothesis was partially supported in that having a mental health problem was related to service use while problem drinking was not (< Table 8 >). Compared to the *Healthy* group, those in the *Physical MCC* and *Physical and Mental MCC* groups were more likely to report visiting professionals for mental or behavioral health problems. The additional group comparisons revealed that those in the group with *Physical and Mental MCC* were more likely to use mental health services than those in the *Physical MCC* group (RRR=1.886; 95% CI, 1.166–3.052, p=0.01). Being in the *Physical and Drinking MCC* group was not significantly related to mental health services use.

There was no difference in mental health services use between the baby boomers and the pre-boomers. A post hoc analysis was conducted to examine if the types of mental healthcare services that older individuals visited vary in the two age cohorts. Among the 393 older respondents who had received professional mental health care, two thirds (66.4%) reported visiting a general practitioner or medical doctor to manage their mental health or emotional problems. Approximately one fourth (26.5%) talked with mental health professionals including a psychologist, professional counselor, marriage therapist, or social worker. Sixteen percent reported talking with a psychiatrist and sixteen percent visited a spiritual advisor such as a

minister, priest, or rabbi. A significantly higher proportion of baby boomers (6.4%) visited a mental health professional compared to pre-boomers (3.2%; χ^2 =9.87, df=1, *p*=0.002). There were no significant differences by age cohort for the other types of professionals.

However, gender, marital status, and income were significant. Female older adults were 1.288 times more likely than males to seek help for their mental health care than males. Compared to the married people, separate or divorced individuals were 1.645 times more likely to visit mental health services. As for education, older adults who had graduate school education were 1.472 times more likely to use treatments or services for their mental health care than those with a high school or less education.

OR	95% CI	р
-	-	-
1.147	[.890, 1.477]	0.289
-	-	-
.925	[.630, 1.357]	0.690
-	-	-
1.288	[1.019, 1.629]	0.034
-	-	-
1.645	[1.209, 2.237]	0.002
1.018	[.696, 1.490]	0.926
1.019	[.630, 1.648]	0.940
	OR - 1.147 - .925 - 1.288 - 1.645 1.018 1.019	OR 95% CI - - 1.147 [.890, 1.477] - - .925 [.630, 1.357] - - 1.288 [1.019, 1.629] - - 1.645 [1.209, 2.237] 1.018 [.696, 1.490] 1.019 [.630, 1.648]

< Table 8 > Logistic Regression Results in Examining the Effect of Health Profiles on Older Adults' Mental Health Services Use (n=2,019)

	OR	95% CI	р
Educational Attainment			
(High school graduation or less)	-	-	-
Some college	.808	[.569, 1.147]	0.232
College graduation	1.212	[.896, 1.639]	0.213
Some graduate school or more	1.472	[1.051, 2.063]	0.025
Income	.999	[.999, 1.000]	0.482
Health Profiling Group			
(Healthy)	-	-	-
Physical MCC	1.391	[1.048, 1.845]	0.022
Physical & Mental MCC	2.622	[1.675, 4.107	0.000
Physical & Drinking MCC	1.407	[.936, 2.114]	0.100

< Table 8 > (cont'd)

Question 4: How does age cohort moderate the association between the patterns of physical and behavioral conditions and mental health services use?

<u>Hypothesis 4</u>: Baby boomers with behavioral health problems will be more likely to use mental health services than pre-boomers with the same problems.

The last hypothesis was not supported in this study. As presented in < Table 9 >, the interaction between MCC class and age cohort was not significant. Other results were nearly the same as those of the third hypothesis. Female older adults were 1.285 times more likely to use mental health services than their male counterpart. Older individuals who were separated or divorced were 1.652 times more likely to use mental health services than married ones. Those with graduate school were 1.450 times more likely to use professional mental health care services than those who had a high school education or less. Older individuals in the *Physical MCC* and *Physical and Mental MCC* groups were 1.652 and 2.456, respectively, more likely to receive professional mental health care than those in the *Healthy* group. The *Healthy* individuals were 39% less likely to use mental health services than those with *Physical MCC* and 59% less likely to use the services than those with *Physical and Mental MCC* and 59% less likely to use the services than those with *Physical and Mental MCC* and 59% less likely to use mental health services than those with *Physical MCC* and 59% less likely to use the services than those with *Physical and Mental MCC*.

< Table 9 > Logistic Regression Results in Examining the Effects of Health Profiles and Age Cohort on Older Adults' Mental Health Services Use (n=2,019)

	OR	95% CI	р
Age			
(Pre-boomer)	-	-	-
Baby boomer	1.261	[.902, 1.763]	0.175

	OR	95% CI	р
Race			
(White)	-	-	-
Non-white	.926	[.631, 1.359]	0.694
Gender			
(Male)	-	-	-
Female	1.285	[1.016, 1.625]	0.037
Marital Status			
(Married)	-	-	-
Separated or divorced	1.652	[1.214, 2.247]	0.001
Widowed	1.030	[.703, 1.509]	0.879
Never married	1.029	[.636, 1.666]	0.907
Educational Attainment			
(High school graduation or less)	-	-	-
Some college	.811	[.571, 1.151]	0.241
College graduation	1.201	[.888, 1.626]	0.235
Some graduate school or more	1.450	[1.034, 2.034]	0.031
Income	.999	[.999, 1.000]	0.503
Health Profiling Group			
(Healthy)	-	-	-
Physical MCC	1.652	[1.071, 2.547]	0.023
Physical & Mental MCC	2.456	[1.318, 4.578]	0.005
Physical & Drinking MCC	1.745	[.930, 3.274]	0.083
Age * Health Profiling Group			
(Baby boomer * Healthy)	-	-	-
Baby boomer * Physical MCC	.740	[.416, 1.317]	0.306
Baby boomer * Physical & Mental MCC	1.239	[.502, 3.063]	0.642
Baby boomer * Physical & Drinking MCC	.703	[.308, 1.605]	0.403

< Table 9 > (cont'd)

CHAPTER 5: DISCUSSION

As life expectancy increases, the proportion of older adults in the U.S. population continues to increase and is predicted to rise over the next several decades (U.S. Census Bureau, 2010). One potential drawback to longer life expectancy can be living longer with chronic illness. At least one of three middle-aged and older adults in America has two or more chronic medical conditions, and approximately 62% of adults over the age of 65 years live with MCC (CDC, 2016; Ward, Schiller, & Goodman, 2014). Although MCC is common among older adults, the American healthcare service system may be less equipped to care for potentially higher percentages of those living with MCC. Moreover, scholars in aging research have not devoted adequate effort to understand the rising need: A more robust understanding of MCC heterogeneity and the relationship of MCC and health service use will promote higher quality healthcare among middle-aged and older adults.

As an initial effort to address MCC heterogeneity and the relationship between MCC and health service use, this study examines how both physical and behavioral chronic health conditions group together a sample of adults aged 50 years and older and how these groupings differ between baby boomers and pre-boomers (study questions 1 and 2). This study further examined (study questions 3 and 4) how health profiles were associated with the use of professional mental health services and whether this relationship varies by age cohort. The following sections evaluate each study hypothesis, highlight how the study results fit into the research context (coping with MCC), and discuss implications of the findings.

Evaluation and Interpretation of Research Hypotheses

The first hypothesis was supported by the study results: There are four major groupings of physical and behavioral health conditions. However, the nature of the groupings themselves differed from what was predicted in that no one class incorporated both mental health issues and problem drinking. Rather, each MCC class included physical conditions either alone or in combination with behavioral conditions. One third of adults aged 50 years or older indicated some levels of MCC. This is consistent with extant literature, much of which has studied physical health conditions among community-dwelling older adults (Hajat et al., 2017; LeBreton, 2015; Marengoni et al., 2008; Vogeli et al., 2007; Ward et al., 2014). This suggests that the inclusion of behavioral health in the definition of MCC does not increase the proportion of older individuals with MCC identified but highlights a different characteristic to MCC that has not been previously noted.

The group with Physical MCC and multiple physical conditions, prioritizes high blood pressure and diabetes as most important health conditions. According to extant literature, these two medical conditions are common among older people (Anderson & Horvath, 2004; Goodman, et al., 2013; Parekh et al., 2011; Schneider, et al., 2009). Their comorbidity is further supported by recent MCC studies (CMS, 2012; Hajat, et al., 2017). High blood pressure was the most common chronic condition appearing in 40% of the sample. This percentage is lower than 70%, which the CDC reported as the proportion of high blood pressure among Americans over the age of 65 years (CDC, 2018). However, noticeably, high blood pressure was detected in all MCC groups in this study at a moderate or high level of probability and the study sample embraced the middle age, starting from age 50. Given that high blood pressure among person older than 50 years is a risk factor to other health problems such as heart disease, stroke, and kidney diseases

(CDC, 2018; Chobanian et al., 2003), ongoing treatment and chronic care will be necessary. Diabetes is also drawing serious attention. Stetson, McDonough and Mokshagundam (2015) projected that diabetes-related mortality would double from 2005 to 2030 with the rapidly growing population of older adults in the United States. Furthermore, both high blood pressure and diabetes can worsen with consistent unhealthy drinking behaviors (NIAAA, 2018).

Although these two medical conditions require continuous treatment, there is a shortage of effective long-term treatments, comprehensive health care systems, and prevention that consider the interactions between them. Boyd et al. (2005) pointed specifically to an absence of clinical practice guidelines designed to improve the quality of health care for many chronic conditions. They also indicated that most clinical practice guidelines in the United States do not modify or discuss the applicability of their recommendations for individuals aged 65 years or older with multiple comorbid diseases. Most also do not comment on the burden or on the short-or long-term goals, nor do they comment on the quality of underlying scientific evidence, or give guidance for incorporating patient preferences into treatment plans. In addition, a comprehensive long-term health care plan is urgently needed. The study results showed that high blood pressure was also present in the groups with mental health problems or drinking issues. Although the comorbid physical and behavioral health conditions are obvious (Anderson et al., 2001), the current primary care system lacks the provision of desirable, comprehensive long-term treatments (Boyd et al., 2005).

The group with Physical and Mental MCC has the greatest number of physical conditions compared to either the Physical MCC or the Physical and Drinking MCC groups. This result is in harmony with previous research, which posits a strong relationship between physical and mental health conditions (Barnett et al., 2012; Hajat et al., 2017; Marengoni et al., 2008). Although the

group with Physical and Mental MCC accounts for 5% of the total sample, among those with some form of MCC, 15% report both a physical and mental condition. One possible reason that this group has more physical health conditions than either of the other MCC groups may stem from the lifetime prevalence of mental health problems that make older individuals unable to effectively manage multiple medical conditions during old age. A study by Scott and colleagues (2008) supports that the majority of older persons with depression and/or anxiety over time show comorbid physical conditions while those with chronic physical conditions tend to have no comorbid mental disorders.

Another possibility is that multiple physical conditions may cause older people considerable distress and may incite or exacerbate mental health problems as a result. Physicalmental comorbidity becomes more common as people age and is particularly more prevalent among those who have more physical disorders (Barnett, et al., 2012). When older individuals deal with many physical illnesses, they may become more easily tired and lethargic, and they may feel that their overall health condition is poor, which can generate depression or anxiety. If these physical problems are chronic, their influences on mental health may be pervasive. Naylor et al. (2012) support the hypothesis that a long-term physical health condition may incite or generate mental health problems, and many may experience significantly poorer health outcomes and reduced quality of life as a result.

Indeed, the relationship between physical and mental health problems seems to be bidirectional. Older patients with severe and enduring mental health problems such as chronic depression or a psychotic disorder can be at high risk of developing long-term physical conditions, and the risk of mental health problems can increase substantially in those with longterm physical conditions. Depression and anxiety in the present study were determined by their

prevalence during the past year using cross-sectional data making it difficult to tease out the directionality of this relationship.

From the group with Physical and Drinking MCC emerged an unexpected but interesting result: Although only 8% of the total sample reported drinking daily in the last month and 9% reported heavy drinking, all individuals in this Physical and Drinking MCC group reported having at least one drink a day and had the moderate probability of having more than three drinks at a time on average. The proportion of these older adults comprised about 24% among those with MCC, despite accounting for barely 8% of the total sample. Previous literature found that approximately 40% of older Americans 65 years and older consume alcohol, whereas 1% to 2 % met the criteria for alcohol abuse or alcohol dependence (Babaturnde et al., 2014). Although problem drinking is more common in community-dwelling older adults than alcohol abuse or dependence, unhealthy drinking patterns have been disregarded because they do not align with the concept of physical dependence on alcohol consumption as alcohol abuse or dependence do (Merrick et al., 2007; Walitzer & Connors, 1999; Wilson et al., 2014).

Additionally, problem drinking is more common in older individuals who have greater social and economic stability and personal resources (Barnes et al., 2010; Blazer & Wu, 2009; Merrick et al., 2008) whereas alcohol use disorder is associated with older people with less education and lower income (Barnett et al., 2012; Compton, Thomas, Stinson, & Grant, 2007; Karlamangla, Zhou, Reuben, Greendale, & Moore, 2006; Sacco, Bucholz, & Spitznagel, 2009; Sorocco & Ferrell, 2006). Falling into this bias that older alcoholics are associated with low socioeconomic status (SES), physicians are less likely to identify problem drinking among older adults with higher SES (Moore et al., 2011). When this trend is considered, it seems that problem drinking among the older adult population may not be fully detected nor properly treated.

Recent studies (Moos et al., 2009; Merrick et al., 2008) caution that unhealthy drinking patterns can generate serious problems among older adults. Although problem drinkers do not suffer from severe physical dependence on alcohol, their heavy or binge drinking can lead them to experience occasional drinking-related accidents such as falls and fractures or car crashes. Because older adults have a poorer ability to metabolize alcohol as they age, their heavy drinking can also aggravate their overall health status, causing diabetes, high blood pressure, congestive heart failure, liver problems, weak bones, memory problems, or mood disorders to deteriorate (NIAAA, 2018; Saitz, 2003). The NIAAA (2018) warns that even mild or moderate drinking can lead to worse health outcomes when older individuals take medications.

Nevertheless, many older community-dwellers drink more than the NIAAA's standard limit by which variables for this study were operationalized. Even older adults who do not drink more than the recommended limit can be at risk for harmful alcohol–medication interactions depending on the type and number of medications they are prescribed (Boyd et al., 2005; Wilson et al., 2014). Given that problem drinking is more prevalent among older adults than alcohol use disorders such as abuse or dependence, it is important to increase the awareness of problem drinking among community-dwelling older adults.

The second hypothesis regarding differences in health profiles by age cohort was not supported. The hypothesis was rooted in earlier literature, which demonstrated that the baby boom cohort was exposed more to mental health and alcohol/substance abuse issues: The social norms and values under which baby boomers were grown up in their teenagers and young adulthood, in particular their lifestyle and lenient attitude toward alcohol, might contribute to more behavioral health problems in their later life (Babatunde et al., 2014; King et al., 2013; Martin et al., 2009). The present study showed a significant difference between the baby boomer
and pre-boomers; However, contrary to expectations, baby boomers were more likely to belong to the healthy group while pre-boomers comprised a higher proportion of all three MCC groups. One reason for this may be the fact that there was not a behavioral health group separate from physical conditions as originally hypothesized. Given the presence of physical conditions in each of the MCC groups, a higher prevalence of pre-boomers in these groups makes sense. In fact, of the 10physical and behavioral health indicators, only heavy drinking was significantly higher among baby boomers (12.5%) than pre-boomers (4.5%). Six physical conditions were more prevalent among pre-boomers (ranging from 8% to 49%) than baby boomers (range, 3% – 35%), whereas 10% of baby boomers reported drinking daily compared to 7% of pre-boomers. The prevalence of stroke and mental health problems (i.e., anxiety or depression) were not significantly different between the two age groups.

Beyond the age cohort difference, gender, education, and income contribute to the apparent differences across each group. Male older adults are more likely to have Physical and Drinking MCC than females, which is consistent with the studies in the literature (Compton et al., 2007; Moos et al., 2009; Sorocco & Ferrell, 2006; Walitzer & Connors, 1999). Compared to the healthy older persons, those with Physical MCC are associated with lower SES. The link between lower SES and MCC has been supported by previous studies (Fortin et al., 2005; Marengoni et al., 2011; Wolff et al., 2002). According to cumulative inequality theory, which considers how inequality accumulates over the life course (Ferraro & Shippee, 2009; Willson, Shuey, & Elder, 2007), the person with low income and education can encounter more difficulties in the processes to address their health problems, causing negative health outcomes, low functioning, and more level of morbidity. The negative relationship between education and health still stands for older people in the group with Physical and Mental MCC, but not those

with Physical and Drinking MCC. Regardless of health profiles, the healthy group consists of the higher proportion of baby boomers while all MCC groups have the higher proportion of preboomers. This result might be attributable to baby boomers' higher income and educational level than the pre-boomer generation. The effect of high SES is supported by previous studies, which argue that aging baby boomers' beneficial health outcomes result from being better educated and possessing more disposable income than members of previous generations (Martin et al., 2009; Rice et al., 2004; Zapolsky, 2004).

The third hypothesis stated that older individuals' health profiles would be associated with their mental health service use. In particular, older people with more mental health care needs were expected to use more mental health services. This hypothesis was partially supported. As expected, older individuals with Physical MCC or Physical and Mental MCC were more likely to seek mental health care to meet their needs than healthy people. However, older individuals with Physical and Drinking MCC did not show any significant difference in seeking mental health care compared to healthy people and those with different types of MCC. In the former case, more mental health service use by those who have physical or physical and mental health MCC may be explained with reference to the behavioral model for health service use (Andersen, 1995). Within the services use framework, the increased perceived need for mental health care leads to more mental health services use. Older patients with only Physical MCC showed a higher incidence of high blood pressure and diabetes, but a low probability of depression and anxiety compared with older patients who have both Physical and Mental MCC. Those in the Physical MCC group may not have objective needs for mental health treatments as evidenced by a depression or anxiety diagnosis, but they may worry about their overall health status or suffer from psychological distress when dealing with other physical conditions. People

in this group are sometimes termed the "worried well," a moniker indicating people who do not meet the diagnostic criteria for a mental health problem but seek help for more general emotional or psychological suffering (Lord & Iudice, 2012). More than the other groups, it seems reasonable that the group with Physical and Mental MCC seek mental health care. As discussed above, older adults in this group reported the most physical and mental health conditions, suggesting that they are most at risk for mental health problems (Barnett et al., 2012). We would expect, therefore, that they have both more objective and perceived mental health care needs than healthy people or those with other types of MCC, which leads them to seek more mental health care services.

However, the Physical and Drinking MCC group was not significantly different from the Healthy group in terms of seeking mental health services. Older individuals with Physical and Drinking MCC were more likely to be pre-boomer, male, more educated, and have the highest average income. One possibility of this group unassociated with more mental health service use may be rooted in the greater likelihood of male older adults to be in this group. According to the literature, men are less likely to use mental health services than women (Addis & Mahalik, 2003; Ang, Lim, & Tan, 2004; Vogel & Wester, 2003). This gender imbalance in mental health service utilization can be associated with the higher prevalence of mental health problems in female older adults (Kessler et al., 1994) and their willingness to disclose psychological concerns (Uebelacker et al., 2006). Another possibility attributes that problem drinking may be less recognizable as a problem that requires treatment. Given the most advanced education among older adults in this group, physicians may less doubt if these patients have unhealthy drinking problems (Moore et al., 2011), or they may detect older adults' problem drinking pattern more

when they apply the diagnostic criteria for alcohol abuse and dependence and refer these patients to specialists to receive proper treatments.

The last hypothesis was not supported. Despite the manifest effect of older individuals' health profiles on their mental health services use pattern, this relationship was not moderated by two age cohorts. The aging baby boomers were healthier than the pre-boomers, and the age cohort difference did not determine whether older individuals would use mental health services. Indeed, no cohort difference was shown among the three MCC groups, and the result of Hypothesis 4 was nearly the same as that of Hypothesis 3. These results suggest that the association between classification and service use does not differ between the two age groups. Mental health services use is recognized to be more associated with female (Gonzalez, Alegria, Prihoda, Copeland, & Zeber, 2011), divorced, or separated people (Narrow et al., 2000), and with those who have higher levels of formal education (Ojeda & Bergstresser, 2008). Older adults with MCC, except those who report Physical and Drinking MCC, use more mental health services to meet their needs.

Limitations of Research

This study should be interpreted in light of several limitations. First, the results of this study relied on the self-reporting of chronic conditions by respondents in the MIDUS III survey rather than on the evaluation of medical records. Although several studies argued that self-report of illness generally overlaps with medical data (Kehoe et al., 1994; Kriegsman et al., 1996), others insisted on the inconsistency between self-report and medical records (Cigolle, Nagel, Blaum, Liang, & Quinones, 2018; LeBreton, 2015). Older individuals may not accurately recollect the conditions with which they have been diagnosed or for which they have been

treated. In addition, they may not completely answer questions regarding mental health conditions or drinking problems because older people may feel more shame or stigma when disclosing mental illness or alcohol conditions as opposed to physical illness (Conner et al., 2010a; Schnittker, 2013).

In addition, the timeframe of the questions varied across the conditions. For example, reports of heart disease and cancer were based on lifetime experiences; problem drinking was based on the past month; and all other conditions were based on the last year. This inconsistent duration of each health and behavioral condition could be associated with several unexpected study results.

The limitation of data is also associated with the way that the questions were posed. For example, physical and mental health items were structured using medical index diseases or the Diagnostic and Statistical Manual of Mental Disorders (DSM) diagnosis criteria, whereas alcohol use focused on problematic behaviors rather than diagnosis, similar to the physical and mental health items. Although substance abuse was among the other DSM diagnoses assessed in the SAQ, the question did not distinguish between alcohol and drug and yielded a small sample for analysis.

The study only investigated community-dwelling older adults and did not include a measure of health insurance. Considering that the prevalence of MCC and healthcare services use varied by living conditions (Britt et al., 2008; Fortin et al., 2012) or health insurance (Karlin & Humphreys, 2007; Roll, Kennedy, Tran & Howell, 2013), the study findings can be only generalized to community-dwelling older adults and do not allow for an examination of access to or affordability of services.

Finally, the lack of accurate cohort comparison is also associated with study limitations. The study design used a cross-sectional approach to compare health conditions and help-seeking behaviors toward mental health care between baby boomers and pre-boomers, but no cohort differences were observed. As Yang (2008) indicated, age-period-cohort (APC) analysis using longitudinal data, rather than the comparison between two age cohorts at a single survey point, is a more precise way to isolate differences between the two cohorts examined in the present study. Because this study used only one wave of MIDUS panel data, the study analyses for the cohort effect were conducted by comparing divided age groups applicable for each cohort rather than via the APC analysis. This methodological limitation might account for the insignificant study results, which are inconsistent with the extant literature. Cohort comparisons using all three waves of MIDUS data may compensate for this weakness—although the APC cannot differentiate aging thoroughly from period or cohort effects.

Despite these limitations, results from this study have important implications for social work practice, policy, and research.

Implications for Clinical and Social Work Practice

This study aims to explore heterogeneity in older adults with MCC and identified four classes: Physical MCC, Physical and Mental MCC, and Physical and Drinking MCC. Given the frequency with which mental health and substance use issues co-occur (Choi et al., 2015; Salmon & Forester, 2012; SAMHSA, 2012), we expected respondents with these issues to group together in one class. The fact that they are separate is an interesting result with a variety of implications.

First of all, the strong physical-mental comorbidity needs to be considered when identifying older individuals' MCC, providing comprehensive and long-term healthcare services, and educating those older patients with practical management skills. To that end, a clinical practice guideline to care for and educate older patients with physical and mental health problems is urgently needed. Although clinical practice guidelines have been developed to improve the quality of health care for many chronic conditions, most clinical practice guidelines in the United States do not have short- or long-term goals, provide the quality of underlying scientific evidence, and incorporate patient preferences into treatment plans (Boyd et al., 2005). Existing practice guidelines would benefit from more consideration of the applicability of their recommendations for individuals aged 65 years or older with multiple comorbid diseases, particularly comorbid physical and mental health issues.

Developing long-term practice guidelines for caring for older patients with the physicalmental comorbidity should also consider the systemic change of primary care toward a CCM framework. In CCM, professional social workers in geriatric primary care settings can mediate differences in health care treatments between primary and secondary healthcare systems and facilitate older patients with different types of MCC to receive healthcare services for managing their multiple conditions. In the context of mental health, a medical social worker in an integrated healthcare team within primary care can act as a bridge between doctors and mental health professionals, help all health professionals on the team better understand the older patient's complex physical and mental health care needs, and devise a comprehensive treatment plan on behalf of the individual patient. Social workers can also help older patients manage treatment plans for their physical and mental health conditions and improve patients' ability to advocate with healthcare professionals on their own behalf.

Next, a better assessment of older adults' problem drinking behaviors, distinct from the diagnostic criteria for alcohol use disorder, is needed for the older population. The literature has indicated the tendency toward underdiagnosis and misidentification of alcohol use problems among older adults despite its serious health consequences (Menninger, 2002; Choi et al., 2015). Nevertheless, problem drinking is more common in community-dwelling older adults than alcoholism (Kirchner et al., 2007), and even mild or moderate drinking can lead to negative alcohol-medication interactions (Babaturnde et al., 2014; Wilson et al., 2014).

An impressive result of this study is that three times more baby boomers reported heavy drinking compared to pre-boomers although the baby boomers were more likely to be in the healthy group. As Moore et al. (2011) indicated, however, physicians can be less likely to identify problem drinking among older individuals with higher SES. Although older adults are more likely to adhere to alcohol misuse treatments and achieve a better long-term outcome than younger people, few older individuals are screened for alcohol problems and thus are not treated (Oslin, Pettinati, & Volpicelli, 2002; Satre, Mertens, Arean, & Weisner, 2004; Sorocco & Ferrell, 2006). Given the dearth of widespread recognition of unhealthy problem drinking, clinicians and other healthcare providers must strive to detect unhealthy alcohol consumption and create awareness of the importance of implementing appropriate strategies to reduce the incidence and the severity of problem drinking among baby boomers.

Medical social workers in geriatric healthcare units or an alcohol-specific care team in primary care units need to be aware of the severity of problem drinking among communitydwelling older adults. In addition, social workers in any setting where they work with older adults can make efforts to increase the awareness of staff, clients, and caregivers about problem

drinking in combination with medical health conditions and the detection of older adults' unhealthy drinking patterns.

Outreach education will be beneficial to increase public awareness about the risk of problem drinking in the older population. Public education developed in response to identified unhealthy drinking patterns and its risk factors need to be shaped according to a more in-depth understanding of the specific characteristics or contexts of drinking behaviors. For example, baby boomers with unhealthy drinking behaviors tend to carry those over into older age which with potentially negative health characteristics (Colliver et al., 2006)). Age-appropriate biopsychosocial interventions including brief interventions, family interventions, motivational counseling, or cognitive behavioral therapies may be useful for educating baby boomers to reduce alcohol misuse. Meanwhile, Merrick and colleagues (2008) intimate that "happy hours" in assisted living facilities can play a significant role in encouraging unhealthy drinking, therefore education and intervention may be necessary for those settings. A prevention program against older adults' problem drinking in other housing settings, such as nursing home or independent-living units, is a worthy consideration. The most important feature of residential facilities for continuing care is that all needs can be met. When the needs are not perceived nor identified, however, no intervention or prevention can be given.

Many studies have also indicated that age discrimination is apparent in primary and secondary healthcare service systems, which prevents older patients from receiving treatments and higher-quality care (Avezum et al., 2005; Luker, Wall, Bernhardt, Edwards, & Grimmer-Somers, 2011; Roy & Chaudhuri, 2008). Primary healthcare providers frequently complain about spending time evaluating older patients' lengthy history and medication use as well as communicating about a complex set of medical conditions (Kane & Kane, 2005). Physicians in

long-term care often make false, ageist assumptions that various symptoms of depression and other behavioral isues are natural attributes of old age rather than signs of disease, resulting in poor quality of care (Luker et al., 2011). Furthermore, healthcare providers are reluctant to serve older patients because of funding constraints of Medicare (Roy & Chaudhuri, 2008). With healthcare professionals' negative attitudes, older patients with MCC will be treated less desirably and face greater challenges to receive multiple healthcare services appropriate for their complex healthcare needs. Social work professionals can advocate a high quality of older people's health care and protect their rights to receive non-ageist healthcare treatments.

Implications for Healthcare Policy

Informed policy-making and planning necessitate an understanding of the present and probable future distributions of MCC in the older population and its effects on their overall health and quality of life. The prevalence of MCC in the older population continues to increase with potentially adverse impacts on overall health and quality of life (CDC, 2016; Tinetti et al., 2012; Vogeli et al., 2007). Eliminating social and economic inequalities in access to health care and developing a long-term health care system to meet the needs of older people with MCC are critical policy issues in contemporary public health.

Consistent with MCC literature, one-third of community-dwelling older Americans in this study have MCC that includes both physical and behavioral health issues. Reducing the cost of chronic disease care as well as the detection and management of various types of MCC in geriatric healthcare systems must be optimized. To that end, current geriatric healthcare systems should be changed to support older adults' overall health conditions over the long run and to systematically incorporate behavioral health into this support. As many studies indicated, most

current primary care systems focus on acute and single diseases to address the older patients' health conditions (Crowley & Kirschner, 2015; Marengoni et al., 2011; Moffat & Mercer, 2015; Vogeli et al., 2007). Acute care for single diseases often means that behavioral health issues are overlooked and that it is difficult to structure effective long-term healthcare that reduces costs and advances the quality of care.

The gradual adaptation of CCM into the current healthcare system will be ideal for improving the overall health conditions and quality of life in the older population. Several empirical studies have already demonstrated the effectiveness of CCM on self-management among individuals with physical chronic diseases such as diabetes, asthma, and heart failure. For example, older diabetes patients who experienced CCM-based health services delivery reported improved health outcomes as well as better quality of care than the counterparts in traditional healthcare service systems (Sperl-Hillen, Solberg, Hroscikoski, Crain, Engebretson & O'Connor, 2004). Older patients with heart failure who enrolled in programs using multidisciplinary teams and in programs using in-person communication had significantly fewer hospital readmissions and readmission days compared to routine care patients (Sochalski et al., 2009).

Conversely, the lack of communication and cooperation between the physical and behavioral health service systems negatively effects outcomes for many older adults who rely largely on the primary care system (Crowley & Kirschner 2015). Adding integrated care, that incorporates mental health care services into primary care, to the CCM framework may improve outcomes for older adults with physical and behavioral MCC. Indeed, some recent studies have supported the effectiveness of this approach in providing depression treatment in primary care settings. Older patients with different mental health disorders involving depressive disorders, bipolar disorders, or anxiety disorders showed fewer clinical symptoms, reported better

psychological and physical quality of life, and improved social role functions within the CCM healthcare system than those in the conventional healthcare system (Woltmann, Grogan-Kaylor, Perron, Georges, Kilbourne, & Bauer, 2012).

Future public healthcare plans and insurance policies should be structured in such a way to support proactive care coordination and transitions in the community within the Integrated CCM framework. Mental health care for older people is rare in community settings, and most older patients tend to obtain care in general medical sectors such as primary care units while most professional psychiatric practices are provided in specialty care units (Maust, Kales, & Blow, 2015). Medicare reimburses only 50% for outpatient mental health treatment services while 80% for general physical health care such as ambulatory healthcare services (Vogeli et al., 2007). The combination of the fragmented structure of medical and mental health service systems and the disparity in health insurance benefits has been identified as a significant barrier for older individuals to receive professional mental health care services along with increased financial burden (Moffat & Mercer, 2015; Unutzer et al., 2002).

The change of health insurance plans can promote overall health care in the older population and further stimulate healthcare system changes. The Patient Protection and Affordable Care Act (PPACA, or ACA) of 2010, has been adapted to provide comprehensive, affordable health insurance; improve healthcare quality; lower costs; improve access, and provide consumer protections. Since the introduction of the ACA, access to mental health and alcohol or substance treatment services has improved (Bartels, Gill, & Naslund, 2015; Eden, Maslow, Le, & Blazer, 2012; Golden & Vail, 2014; Mechanic, 2012). Compared to previous Medicaid standards, for example, the ACA has expanded state-specific Medicaid services by up to 133%, dramatically increasing coverage among those who are Medicare ineligible (Eden et al.,

2012). With this Medicaid expansion, more mental health care became affordable to older adults with lower incomes.

Under the ACA, older adults with MCC can also benefit from an integrated and collaborative system of care that involves both mental health and alcohol abuse treatment systems. Golden and Vail (2014) suggest that Medicare-Medicaid system coordination will also alleviate the high costs that result from duplicate beneficiaries in two systems and will improve the quality of care. Indeed, 17% of Medicaid beneficiaries are dually eligible for Medicare and Medicare, and more than 9% are low-income seniors. By reducing duplicated benefits and providing an accountable care organization, the ACA facilitates older adults with MCC at risk of the high cost of receiving multiple healthcare services. Changes in the healthcare system and insurance are in need of further public discussion to amplifying the benefits.

Implications for Future Research

This study aims to expand knowledge on aging research, especially for health profiles in an aging cohort. The baby boomers in the United States represent approximately one third of the total U.S. population and continue to join the older population (Whitbourne & Willis, 2006). The large segment of the aging baby boomers and the wide variation in older people's health characteristics have caused exorbitant healthcare costs. In identifying detailed information on aging baby boomers' health conditions and the associated characteristics of their specific health combination, this study suggests that future studies need to explore cohort-related aging health conditions. For example, the millennials, also known as Generation Y or people born after the early 1980s and before the early 2000s, surpass the baby boomers as American's largest generation (Fry, 2016). Huge public spending in health care will not go away once the baby

boomers die. Instead, the large segment of the millennials in the future older population may have different healthcare needs along with their lifestyles and other circumstances when they are grown up. Although aging and health research to date (Hajat et al., 2017; Marengoni et al., 2011; Vogeli et al., 2007) have revealed some combinations of MCC in the older population, knowledge on the heterogeneous health profiles by health conditions or specific age cohorts is still lacking. Further examination on cohort-related health conditions can enhance our knowledge on the heterogeneous health profiles by specific age cohorts, which will be useful for healthcare providers to develop an improved healthcare plan based on that information.

Interestingly, the study results support better overall health status among the aging baby boomers that is different from the findings in previous literature (King et al., 2013; Piazza & Charles, 2006; Rider, 2006). Considering the demographic characteristics of the baby boom cohort, aging research has focused on examining the help-seeking attitudes or behaviors specific in aging baby boomers (Beecham et al., 2008; Gonzalez et al., 2011; Mackenzi et al., 2006). Compared with earlier aging cohorts, for example, baby boomers have higher levels of education and more years of work experience, which should increase their lifetime earnings and economic security as they reach age 65 years and beyond. Financial security and exposure to more helpseeking knowledge and social resources may facilitate more and diverse patterns of help-seeking. The changes in baby boomers' attitudes and public perception toward receiving professional mental healthcare treatments may also alleviate public stigma that impede older people's mental health services use. Although this study did not verify baby boomers' proactive behaviors toward their mental health care, recent research (Woodward, 2013; Groden, Woodward, Chatters, & Taylor, 2017) reported the age cohort difference in that baby boomers are more likely to use various CAM modalities to maintain their mental health than formal mental healthcare service

systems. More studies with the longitudinal approach will be helpful to investigate the age cohort differences.

Future research needs to continue examining older population's contemporary health profiles. This study's outcomes indicate the lack of awareness of the risky problem drinking among community-dwelling older adults, especially for those with high SES. Compared to the well-known knowledge on the severity of alcoholism and negative health outcomes in the older population, little is known about the detailed interactions between age, alcohol, and medications although some literature has revealed the potentially severe prognosis of problem drinking among older adults (Sacco et al., 2009; 2013). Along with the constant change in population health, more research on contemporary health profiles of the older population will be warranted. For example, the latest aging and health studies focus on discovering the impacts of Alzheimer's disease on older adults with MCC (Snowden et al., 2017; Zissimopoulos, Tysinger, St. Clair, & Crimmins, 2018). Ongoing studies aimed at achieving an effective healthcare outcome for managing older people are indispensable.

APPENDIX

< Table 10 > Appendix: Study Variables

Variable Indicators	MIDUS III Variables	MIDUS III Survey Questions	Time Period	Study Variable Names	Study Data Management
Question 1:	<u>I</u>	7	1		
Physical Health	C1PA7 (Telephone Interview)	Heart disease: Have you ever had heart trouble suspected or confirmed by a doctor? Response options: Yes/ No/ Don't know/Refused (responses of "don't know" and "refused" were recorded as missing)	Lifetime	heart	0: no 1: yes
	C1PA26 (Telephone Interview)	Cancer: Have you ever had cancer?	Lifetime	cancer	0: no 1: yes
	C1SA11A (SAQ)	Respiratory disease (asthma/bronchitis/emphysema): In the past 12 months, have you experienced or been treated for this?	Past 12 months	rspr	0: no 1: yes
	C1SA11Z (SAQ)	Stroke: In the past 12 months, have you experienced or been treated for this?	Past 12 months	stroke	0: no 1: yes
	C1SA11X (SAQ)	Diabetes/High blood sugar: In the past 12 months, have you experienced or been treated for this?	Past 12 months	dbts	0: no 1: yes

Variable Indicators	MIDUS III Variables	MIDUS III Survey Questions	Time Period	Study Variable Names	Study Data Management
	C1SA11B, C1SA11C (SAQ)	Lung diseases (tuberculosis, other lung problems): In the past 12 months, have you experienced or been treated for this?	Past 12 months	lung	0: no 1: yes
	C1SA11S (SAQ)	High blood pressure/ Hypertension: In the past 12 months, have you experienced or been treated for this?	Past 12 months	hbp	0: no 1: yes
Behavioral Health	C1SA11T (SAQ)	Anxiety/Depression: In the past 12 months, have you experienced or been treated for anxiety, depression, or some other emotional disorder?	Past 12 months	mental	0: no 1: yes
	C1PA51 (Telephone Interview)	Frequency of drinking: During the past month, how often did you drink any alcoholic beverages, on the average? Would you say every day, 5 or 6 days a week, 3 or 4 days a week, 1 or 2 days a week, or less often than 1 day a week?	Past month	alcdly	0: no 1: yes
	C1PA52 (Telephone Interview)	Average numbers of drinks on days when you drank: By one drink," we mean either a bottle of beer, a wine cooler, a glass of wine, a shot of liquor, or a mixed drink. With this definition in mind, on the days when you drank, about how many drinks did you drink on the average?	Past month	alchvy3	0: no 1: yes

< Table 10 > ((cont'd)
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Variable Indicators	MIDUS III Variables	MIDUS III Survey Questions	Time Period	Study Variable Names	Study Data Management
Questions 2 & 4:					
Age by Birth Cohort	C1PRAGE	Baby boomers vs. pre-boomers: Early baby boomers vs. late baby boomers: This variable will be constructed by the variable of respondent's age. Select study cases: C1PRAGE ≥50 Age range in this study: 50–93 years		babyboom	0: pre-boomer (69–93) 1: baby boomer (50–68)
Question 3:					
Use of Mental Health Services	C1SA50A, C1SA50B, C1SA50C, C1SA50D	 Use of mental health professionals: In the past 12 months, how many times did you see each of the following professionals about your emotional or mental health or about personal problems, such as problems with marriage, alcohol or drugs, or job stress? Include both individual visits and group sessions regarding your problems, but not visits when you took someone else regarding their problems. Psychiatrist General practitioner or other medical doctors Psychologist, professional counselor, marriage therapist, or social worker: mental health professionals Minister, priest, rabbi, or other spiritual advisors 		mhtx psychtst dctr cnslr rlgn	0: no 1: yes

< Table 10 > (cont'd)

Variable Indicators	MIDUS III Variables	MIDUS III Survey Questions	Time Period	Study Variable Names	Study Data Management
Control Variables:					
Sex	C1PRSEX	Sex: Respondent's sex		female	0: male 1: female
Race/Ethnicity	C1PF7A	Race/ethnicity: What are your main racial origins—that is, what race or races are your parents, grandparents, and other ancestors?		nwhite	0: white 1: non-white
Marital Status	C1PB19	Current marital status: Are you married, separated, divorced, widowed, or never married?		marry4	0: married 1: separated or divorced 2: widowed 3: never married
Education	C1PB1	Highest level of education complete: What is the highest grade of school or year of college you completed?		edu4	0: high school graduation or less 1: some college 2: college graduation 3: some graduate school or more
Income	CISTINC	Household total income from wage, pension, social security, and other sources:		income	continuous

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