REASONS FOR USE OF COMPLEMENTARY AND ALTERNATIVE MEDICINE AND PRAYER FOR HEALTH BY OLDER ADULTS IN THE UNITED STATES

by

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ABSTRACT

ELIZABETH MARY TAIT. Reasons for use of complementary and alternative medicine and prayer for health by older adults in the United States (Under direction of SARAH B. LADITKA, PhD, and JAMES N. LADITKA, PhD)

Objectives: This study examined prayer for health and eight specific reasons why Americans ages 50 and over use Complimentary and Alternative Medicine (CAM): effectiveness; cost; recommendations from health care providers; recommendations from family, friends, or co-workers; or for general health, immune function, physical performance, or energy. The analysis focused on variation associated with race or ethnicity, gender, and income. ***Methods:*** We examined praying for health by women and men ages 50+ using data from the 2007 National Health Interview Survey (10,096 respondents, representing about 89.56 million older Americans). Analyses included chi-square and multivariate logistic regression, accounting for the survey design and weighted for national representation. Ethnic groups were non-Hispanic African Americans (African Americans), Hispanics, Asian Americans, and non-Hispanic Whites (Whites). Controls included age, education, marital status, health insurance, comorbidities and changes in health status, smoking status, body mass index, and region. ***Results:*** In multivariate analyses for prayer, African Americans were more likely than Whites to report praying for health in the past 12 months (Odds Ratio, OR 2.55; 95% Confidence Interval, CI 2.16-3.03). In adjusted analyses for heath care recommendations and barriers, women were much more likely than men to use a CAM because it was recommended by a provider (OR 1.96, CI 1.72-2.45). People with high incomes were more likely than people with middle incomes to use CAM for general health (OR 1.25,

CI 1.07-1.47) or energy (OR 1.61, CI 1.19-2.17). ***Discussion:*** Findings suggest that many older Americans pray for health and use CAM because: conventional medicine is too expensive or does not work; it is recommended by a health care provider or by family, friends, or co-workers; or, to improve general health and well-being. African Americans are less likely to use CAM for these reasons than Whites, women more likely than men, and people with lower incomes less likely than those with higher incomes. Older people with chronic conditions, particularly musculoskeletal conditions or depression, are also more likely to use CAM. Providing health care providers with additional CAM training may help them talk with patients about coordinating use of conventional medicine and CAM, in part to avoid potentially serious interactions between some types of CAM and conventional medicine.

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CHAPTER 1: INTRODUCTION

Statement of Problem

Complementary and Alternative Medicine (CAM) use is increasing. Over the past 30 years, both public interest and CAM use have risen steadily in the United states (WHCCAMP, 2002). In a study done to document CAM use trends between 1990 and 1997 in the United States, visits to alternative health care providers increased 47.3% from 427 million to 629 million, exceeding the total visits to all US primary care givers (D. M. Eisenberg, et al., 1998).

The study of CAM use has focused on a variety of populations. However, little attention has been given to CAM use by older Americans. In a search of all EBSCO Host data bases, only 239 hits were returned for "old*" and "CAM" as compared to 6,914 hits looking for "CAM" alone; likewise performing the same search with PubMed, 23,367 hits were found for "CAM," whereas "(CAM) AND old*" returned 1,032 hits.

People ages 50 and older are the largest consumers of medical services, including provider services, hospital services, and pharmaceuticals (Administration on Aging, 2010; Barnes, Powell-Griner, & McFannk, 2004; Mueller, et al., 2008). A substantial number of people may substitute CAM for medical services (Cuellar & Aycock, 2003). Identifying reasons for CAM use in our highly "medicalized" society could help schools that train health care providers to formulate a curriculum more specific to the needs of older Americans. A better understanding of reasons for CAM use among older adults can help health care providers to discuss how CAM may help when conventional medicine is

ineffective (Fink, 2002), caution against CAM use where CAM interacts adversely with conventional medicine (Rhee, 2004), or recommend CAM as a cost effective alternative (Fink, 2002).

It would be useful to better inform physicians, pharmacists, nurses and other health care providers about the prevalence of CAM use, and the need to ask about CAM use among patients and clients. Understanding what CAM are being used. and the reasons for their use, can help to give providers a better understanding of what patients believe their needs are (why are they taking the CAM?) as well as informing providers about potential drug interactions between CAM and conventional medicine (will taking this herb cancel out the prescribed benefit of conventional medication, or worse, cause harm?). It is also the responsibility of providers to ask about CAM use. Frequently, patients do not tell providers about CAM use (Sleath, Callahan, Devellis, & Beard, 2008). This can stem from embarrassment that they are using a CAM and are afraid that their medical provider will tell them to stop using it, or because it just does not cross their minds (Barraco, 2005). Certain herbs taken with the expectation that they may have therapeutic value can have adverse interactions with conventional medications. Thus, CAM use needs to be discussed (Barnes, Powell-Griner, & McFannk, 2004). Additionally, discussing underlying reasons why CAM is being used can give providers better insight into patients' medical needs (Mao, Farrar, Xie, Bowman, & Armstrong, 2007).

Background

Complementary and Alternative Medicine has been used since Hypocrites and before. The use of herbs, prayer and rituals were the tools of the original schools of medicine, nursing, and other health care professionals. With the onset of industrialization and standardization came standards for medicine; prayer, herbs and other CAM were shunted into the realm of voodoo medicine and, while not forgotten, experienced a decline in use (Walach, 2009). In the past 30 years, CAM has had a resurgence (Eisenberg, et al., 2008). With the passage of the new Health Care bill, integrated medicine is slated to become more central to United States health care policy (U. S. Congress, 2010). Integrated medicine will require additional coordination of care, including coordination of conventional medication and CAM (Congress, 2010).

Older Americans are using CAM at an increasing rate. The 2007National Health Interview Survey (NHIS) found that 38.3% of American adults used CAM, up from 36% reporting use in 2002 (NCCAM, 2008). Eisenberg and colleagues found an almost 10% increase in CAM use between 1990 and 1997 (Eisenberg & Davis, 1998). Societal trends toward increasing participation in medical decision making since the late 1960s and early 1970s, and the increased availability of medical information on the Internet, have contributed to this trend (McCaffrey, Pugh, & O'Connor, 2007). CAM use in America is highest between ages 50 and 55 (Barnes, et al., 2004).

What is CAM?

The National Center for Complementary and Alternative Medicine (NCCAM), a unit of the National Institutes of Health, defines Complementary and Alternative Medicine (CAM) as a group of health care systems and medical care practices and

products not generally considered as conventional medicine. CAM is defined as complementary, alternative, or integrative medicine. Complementary medicine is used in conjunction with conventional medicine; alternative medicine is used in lieu of conventional medicine; integrative medicine combines traditional medicine and CAM (Barnes, Bloom, & Nahin, 2008). NCCAM has suggested that CAM be organized into four categories: (1) energy medicine, (2) manipulative and body-based practices, (3) biologically based practices, and (4) mind-body medicine (Table 1.1). What is often considered as a CAM in the US often may have been used for many centuries as accepted medical practice by other cultures (Fennell, Liberato, & Zsembik, 2009).

Overview of the National Health Interview Survey (NHIS)

The National Health Interview Survey (NHIS) is a nationally representative survey conducted annually in the U.S. The survey is briefly introduced in Chapter 1. Chapter 2, focused on prayer for health, includes details about the NHIS. The NHIS collects information about use of medical services, health status, and other health measures reported by survey participants. This survey has been conducted annually in the U.S. since 1963. The NHIS is conducted continuously throughout each year. It is a cross-sectional, multistage household survey (NHIS, 2009).

The NHIS is a principal source of health information about the civilian, non-institutionalized population of the United States. The NHIS is conducted by the National Center for Health Statistics (NCHS). Survey exclusions include those who are incarcerated, residents of long-term care facilities, people on active duty with the Armed

Forces, and U.S. nationals living abroad. Dependents of individuals in excluded categories may be included in the survey (NHIS, 2009).

This study uses three components from the 2007 National Health Interview Survey. These components are the Family component, the Sample Adult component, and the Complementary and Alternative Health component (NHIS, 2009). A total of 23,393 adults age 18 and over responded to the CAM supplement; the response rate was 68.7% (Barnes et al., 2008). The Complementary and Alternative Health component contains over 3,000 variables describing the use, use frequency, and intended purpose for use of 36 individual types of CAM (NHIS, 2009).

Prayer for Health

Prayer for health is included in the mind-body CAM category defined by the NCCAM (NCCAM, 2008). A study conducted by Brown, et al. (2007), outlining patterns of CAM use from data collected by the 2002 National Health Interview Survey (NHIS), identified prayer as the most commonly used CAM (Brown, 2007). Prayer is often used with the expectation of healing among African Americans (Brown, 2007). Prayer for health can affect individuals' decisions about: the timing of medical service use; hospitalization, ventilation, or resuscitation; palliative care and hospice use weighed against aggressive treatments with limited chances of success; and compliance with prescribed medical regimens (Phelps, 2009; Silvestri, Knittig, Zoller, & Nietert, 2003; True, et al., 2005). Prayer for health may notably affect individuals' coping ability and risk of depression accompanying serious illness, both of which are associated with health behaviors that influence healing—including sleep, diet, and physical activity (Crowther,

Parker, & Achenbaum, 2002). Thus, prayer for health is a complementary or alternative medicine that may substantially affect both health and the use of conventional medical services. Yet, few studies have examined use of prayer for health by Americans age 50 and older. Schools that train health care professionals and providers of medical services have only recently begun to consider aspects of patient care beyond clinical solutions (Tilden, Drach, & Tolle, 2004; Wetzel, Eisenberg, & Kaptchuk, 1998). Identifying the prevalence of prayer for health could help schools that train health care professionals to develop curricula that better serve the needs of older Americans, and may help health care providers to better serve health care consumers.

Reasons for CAM Use

In 2007, the NHIS tracked nearly 200 variables examining reasons for CAM use, which can be grouped into 11 distinct categories. These categories are: 1) because conventional medicine did not work; 2) conventional medicine was too expensive; 3) recommended by a health care provider; 4) recommended by family, friends, or co-workers; 5) to improve overall health; 6) to improve physical health; 7) to improve immune function; 8) to improve energy; 9) to improve cognitive function; 10) to improve sports performance; or 11) to improve sexual performance (NHIS, 2009). My dissertation research examines CAM use for the first eight reasons just listed (Table 1.2).

Substituting CAM for prescribed pharmaceuticals is one way older Americans perceive they can control costs of medical care (Crowther, et al., 2002), and is likely to increase during hard economic times. People who use CAM often do so to exercise control over their medical care (Barraco, 2005; Crowther, et al., 2002). CAM is viewed

as safer, more natural and less invasive than conventional medicine, so by substituting CAM for a conventional medicine, users may believe they are exercising holistic control over their medical treatment (Barraco, 2005). Cancer survivors often feel that CAM is more holistic and patient-centered than conventional medicine (Hsiao, et al., 2003). While conventional practitioners do not often discuss it, conventional treatments only work well for a portion of the population, and are not always evidence based (Chao, 2006; Eddy, 2005).

Objective of Research

This research has three objectives. The first is to identify characteristics of individuals who pray for health, focusing on gender, race/ethnicity, income, and chronic conditions. The second objective is to identify characteristics of people who use CAM because traditional medicine is too expensive or did not work, or because CAM was recommended by a provider, or family or friends or co-workers, focusing on variations associated with gender, race/ethnicity, income and chronic conditions. The third objective is to examine characteristics of people who use CAM to improve: general health, immune function, physical performance, and energy, also focusing on gender, race/ethnicity, income and chronic conditions. In all cases, the focus will be on older Americans, whose CAM use has been traditionally understudied.

In a review of prescription drug use in the United States between 1988 to 1994, the national Health and Nutrition Examination Survey reported that Americans are the highest users of pharmaceuticals, and their use of multiple prescriptions increases with age (CDC). The report goes on to say that of those aged 65 to 74, 51% use two or more

prescription drugs; 12% use five or more; of those aged 75 and older, those percentages increase to 60% using two or more prescription drugs,16% using five or more (CDC). Additionally, CAM use peaks at ages 50 to 55 (Barnes, et al., 2004). It is thought that many potential CAM-drug interactions have yet to been identified. Providing health care providers with additional CAM training may help them talk to patients about coordinating use of conventional medicine and CAM, potentially eliminating adverse reactions (Abbott, et al., 2010; Maclean, et al., 2003). It may be useful for providers to open the dialog about CAM with their patients, especially women, who frequently use CAM, and African Americans, who frequently do not, along with those with chronic illnesses, and those with less income or with financial difficulties. It is useful for providers to understand who is using CAM, what reasons they have for using it, and what potential advantages or hazards might result from CAM use. Health care policy makers need to have a better understanding of CAM and how the shift in CAM use in medical care is affecting health care delivery. Given the rise in CAM use, it is useful for policy makers to better understand CAM as a market-driven service provision (McCaffrey, et al., 2007). Findings of this dissertation research will contribute to knowledge about CAM use among older Americans, particularly for prayer for health and eight specific reasons for CAM use.

Table 1.1: Major CAM domains (NCCAM, 2008)

Alternative medical system	Manipulative and body-based therapies
Acupuncture	Chiropractic
Ayurveda	Massage
Homeopathic	
Naturopathy	Mind–body therapy
	Biofeedback
Biologically-based therapies	Relaxation
Herbs	Hypnosis
Special Diets	Yoga / tai chi / qi-gong
Vitamins	Prayer
Chelation	

Table 1.2: Reasons for using a CAM given by women and men age 50 and older[a]

Barriers & Recommendations	*Freq*	*Weighted Freq*	*%*
Medical treatments did not help	534	2,407,556	7.49
Medical treatments were too expensive	439	1,903,501	5.92
Recommended by health care provider	2627	11,677,235	36.32
Recommended by family, friends, co-workers	2067	9,182,901	28.56
Physical Wellbeing	*Freq*	*Weighted Freq*	*%*
General wellness, general disease prevention	5441	23,896,101	74.32
Improve physical function	1684	7,371,452	22.93
Improve immune system	2268	10,011,449	31.14
Improve energy	974	4,426,445	13.77
Not Included	Freq	Weighted Freq	%
Improve memory	814	3,560,242	11.07
Improve sports performance	256	1,121,631	3.49
Improve sexual performance	115	527,391	1.64

[a]Data source: National Health Interview Survey (NHIS) 2007

CHAPTER 2: LITERATURE REVIEW

Introduction

Complementary and Alternative Medicine (CAM) has likely been part of the human experience since the first cut or headache. While conventional medicine has done much to advance health and heath care, the efforts to disregard CAM as folk medicine or mere wives' tales have been increasingly under scrutiny. CAM use by older Americans is increasing. Studying who is using CAM, particularly in our older population, is important because some conventional medications do not perform as needed for all people. Some types of CAM may have negative, even drastically negative interactions with conventional medication. Some CAM therapies can have positive effects, such as Tai Chi for those with arthritis. Understanding who uses CAM, and why, can be an important step in forming public policy. It is hoped that this study of CAM will help health care providers, schools that train health care providers, and public policy makers to have a better understanding of who is choosing to use CAM, and why, so that they can be more aware of opportunities to help the public and to guide future studies on the use and efficacy of CAM.

Overview of CAM

CAM includes many products, therapies and practices used to promote wellness and to treat illness (WHCCAMP, 2002). CAM categories have diverse elements, some of which can be found in conventional medicine and some of which cannot (WHCCAMP, 2002). CAM and conventional medicine have common elements, such as an emphasis on

whole systems, self-care, self-healing, and the integration of mind-body as part of the healing or prevention process (WHCCAMP, 2002). Other CAM treatments found in conventional medicine include elements such as preventive practices and good nutrition (WHCCAMP, 2002). CAM providers tend to focus on the individual, which includes treating the individual as a whole person, including a spiritual element, and promoting self-care (WHCCAMP, 2002). Compared with conventional medicine, CAM often lacks scientific proof of efficacy (WHCCAMP, 2002). In part, this is attributable to the fact that Western science has only recently begun to study CAM systematically, and with reasonable funding levels.

The National Center for CAM (NCCAM) is part of the National Institutes of Health (NIH). It is the Federal Government's lead agency for scientific research on CAM (NCCAM, 2009a). Its purpose is to explore CAM in the context of rigorous science with the intent to share the findings with professionals and the public (NCCAM, 2009a). To focus efforts and use research funds efficiently, it is in the public interest to understand the characteristics of older individuals who use CAM, and their reasons for CAM use.

As in the general population, CAM use is increasing among older adults (Astin, Pelletier, Marie, & Haskell, 2000; Cherniack, Pan, & Senzel, 2001; Eisenberg & Davis, 1998; Flaherty, Takahashi, & Teoh, 2001; Ness, 2005). CAM use among older adults can be attributed in part to their multiple health problems, including general poor health and chronic diseases (Cherniack, et al., 2001). Among older people, there is evidence

that CAM is used most frequently for age-related chronic conditions such as cancer, depression, pain and arthritis (Williamson, Fletcher, & Dawson, 2003).

Prevalence of CAM Use

CAM use increased from 33.8% in 1990 to 42.1% in 1997 (Eisenberg & Davis, 1998), although the percentage increase identified depends on the population studied and the specific CAM included in the analysis. Nearly 40% of adults reported using CAM in a recent survey (NCCAM, 2008). In a national survey conducted in 2002, 36% of respondents reported using CAM in the past 12 months; when prayer for health was included that figure rose to 62% (Burke, Upchurch, Dye, & Chyu, 2006). Among cancer survivors, CAM use is estimated to be as high as 83% (Mao, et al., 2007). The White House Commission on CAM reported that public use and interest in CAM has increased steadily over the past 30 years. It is estimated that as much as 43% of the U.S. population uses CAM (WHCCAMP, 2002). The 2007 National Health Interview Survey (NHIS) suggested that 38.3% of American adults used CAM, up from the 36.0% in 2002 (NCCAM, 2008). Among patients of internal medicine teaching clinics, 84% reported using CAM, where that measure included prayer, exercise, or diet used with the expectation of improving health (Rhee, 2004).

CAM use among older Americans has increased and is predicted to grow (Astin, et al., 2000; Cherniack, et al., 2001; Cheung, Wyman, & Halcon, 2007; Eisenberg & Davis, 1998; Flaherty, et al., 2001). Physiological factors are likely to contribute to this increase (Cherniack, et al., 2001). Poor health, multiple health problems, and chronic disease are often associated with CAM use by older Americans (Cherniack, et al., 2001).

As America ages, the increasing number of older Americans is likely to increase the ranks of those who seek to both improve their quality of life and better manage their chronic health problems through CAM (Williamson, et al., 2003).

Societal trends toward increasing participation in medical decision making and increased availability of medical information on the Internet, factors that have influenced health care since the late 1960s and early 1970s, have contributed to increased CAM use (McCaffrey, et al., 2007). Patients who report using CAM indicate that doing so gives them a sense of control over their medical care (S. Wang, Caldwell-Andrews, Kain, & Anesh, 2003).

Disadvantages of CAM Use

Most types of CAM have not undergone rigorous testing (WHCCAMP, 2002). Health care providers may be willing to recommend CAM only if there is strong evidence of safety and efficacy (Cleland, Price, Lee, Sharma, & Sharma, 2006). On the other hand, many conventional medicines work well only for a portion of the population, and most have safety concerns (Chao, 2006; Eddy, 2005). Yet, most conventional medicine is commonly accepted for use despite these limitations. Of course, these arguments do not suggest that CAM should be adopted by conventional medicine in the absence of persuasive information about safety and efficacy.

A number of studies have reported that CAM can interact negatively with conventional medication (Barnes, et al., 2008; Chong, 2008). Poly-pharmacy and drug interactions present potential problems. When people combine prescription medication with CAM, this can often lead to adverse interactions (Cheung, et al., 2007; Tachjian,

2010). Many older adults take multiple prescription medications to control a number of chronic conditions (Dergal, 2002). Older adults using CAM may be at greater risk for adverse reactions between CAM and prescription medication (Dergal, 2002; Tachjian, 2010). In a cross-sectional study conducted in Brunei Darussalam, 21% of 568 randomly selected visitors to the medical wards reported using CAM in addition to their conventional medication (Chong, 2008). Older people are often unaware of the potential negative interactions of CAM and prescription medications (Chong, 2008; Tachjian, 2010).

Adverse drug-CAM interactions can be severe (Dergal, 2002; Tachjian, 2010). Some herbal products can be fatal when combined with prescription medication (Barnes, et al., 2004). For example, health care providers often prescribe aspirin to prevent cardiovascular episodes. Aspirin can react negatively when taken with ginkgo biloba (Dergal, 2002). Hemorrhage as a result of combining aspirin and ginkgo has been reported (Dergal, 2002; Rosenblatt, 1997; Tachjian, 2010).

Communication with Physicians and Other Health Care Providers

Given the potential negative interactions of herbal medicine and conventional medicine, researchers recommend that patients should inform their health care providers of any herbs they are taking, and that providers should ask patients about CAM use (Rhee, 2004). Patients frequently fail to inform health care providers of use of herbs and dietary supplements (Dergal, 2002). Patients do not disclose CAM use because they do not think it is important, or are concerned that their health care provider might disapprove (Barraco, 2005). Lack of awareness about what constitutes CAM is another reason: some

CAM users may not know that what they are taking or doing is considered CAM; thus, they may not report use of some types of CAM even if asked to report CAM use (Chong, 2008). In an age-stratified cross-sectional survey of adults ages 65 and older living in the community (n=1200), 69% reported using CAM; of these, only 53% disclosed CAM use to their primary care providers (Cheung, et al., 2007). Two nationally representative telephone surveys measuring CAM use in 1991 (n=1539) and 1997 (n=2055) found that disclosure rates remained essentially unchanged, with 39.8% of participants telling their health care providers of their CAM use in 1991, compared to 38.5% in 1997 (Eisenberg, et al., 2008). In a study of patients of 23 rheumatologists, 2075 patients received a survey on their CAM use; of the 51% who responded, 17% reported that the physicians did not ask about their CAM use, and 52% that their physician asked about CAM use less than half the time (Sleath, et al., 2008). Patients were more likely to disclose CAM use if the rheumatologists included them in treatment decisions and asked directly about CAM use (Sleath, et al., 2008). Using data from the 2002 NHIS, researchers found that 60% of patients did not discuss their CAM use with health care providers because the health care provider did not ask about CAM use (Eisenberg, et al., 2008).

Health care providers often fail to ask about CAM due to time constraints, or because they did not think to ask (Fennell, et al., 2009). The lack of inquiry about CAM use is underscored in two other studies. In one, 17% of physicians never asked about CAM use (Sleath, et al., 2008). In another, 52% of physicians asked patients about CAM use less than half the time (Corbin, 2002). One researcher suggests that it is the ethical obligation of health care providers to ask about CAM use, not only to avoid possible

herb-drug interactions but also to facilitate open patient-provider communication (Dent, 2006). To promote open discussion about CAM with patients, health care providers need to show an open attitude (Patterson, et al., 2002).

People in ethnic minorities are also unlikely to disclose CAM use to health care providers unless directly asked (Dent, 2006; Grahm, 2005). Discussion about CAM use with primary care health care providers is particularly infrequent among Hispanics and African Americans (Fennell, et al., 2009). The lack of disclosure, sometimes complicated by a language barrier, underscores the need for health care providers to be proactive with patients about CAM use.

The importance of health care providers being knowledgeable about both conventional medicine and CAM was reported by the Medical School Objectives Project in 1998 (Wetzel, et al., 1998). Results from a national study of medical schools, with 51% of US medical schools participating, suggest that more than 60% of medical students support including more study of CAM in their training (Abbott, et al., 2010). Practicing health care providers need more CAM training so they can counsel patients about evaluating the potential risks and efficacy of CAM, and also so they can coordinate conventional medicine with CAM (Abbott, et al., 2010). Although curricula of schools training physicians, nurses, and other health care providers increasingly offer training in CAM, the level of quality and access varies substantially (Abbott, et al., 2010). Many medical students do not view CAM therapies as being evidence based (Abbott, et al., 2010; Chaterji, et al., 2007). This is particularly true of first year medical students (Chaterji, et al., 2007).

Three Areas of Dissertation Research about CAM Use

The next sections describe the literature review I conducted for three areas of CAM use: prayer for health; using CAM because of barriers to conventional medicine and recommendations from health providers, family and friends, and co-workers; and CAM use to improve general health or wellness.

Prayer for Health

The literature review for the first study areas of my dissertation follows.

NCCAM Definition of Prayer

Prayer is included among the mind-body CAM therapies defined by the NCCAM (NCCAM, 2008). In a study conducted by Brown et al. (2004) using data from the 2002 NHIS, prayer was identified as the most common CAM therapy (Barnes, et al., 2004). Prayer is a CAM frequently used by older adults (Arcury, Quandt, Bell, & Vitolins, 2002; Astin, et al., 2000; Barnes, et al., 2004; Cherniack & Pan, 2002; Cherniack, et al., 2001; Cuellar & Aycock, 2003). "Spiritual healing" with the intention of promoting healing or self-healing includes the use of prayer, meditation, and the “laying on of hands” (Cleland, et al., 2006).

Prevalence of Prayer for Health

Use of prayer for health has increased since 1998 (Grahm, 2005). In reviewing the NHIS data for prayer in 2002, Barnes reported that in the past 12 months, about 45% of adults prayed for health (Barnes, et al., 2008). Results from the 2002 NHIS Alternative Health Supplement revealed that prayer was one of the most used CAM (Grahm, 2005). For women with a genetic risk for breast cancer, spiritual healing and/or

prayer was the most commonly reported CAM, at 48.8% (C. Mueller, et al., 2008). In a 2007 study examining CAM use and chronic fatigue illness, researchers found that 63.1% of the study participants reported praying for health (Jones, et al., 2007). Research suggests extensive CAM use among cancer survivors, with estimates as high as 83% when prayer is included (Mao, et al., 2007). Prayer is most frequently used for chronic conditions for which traditional medicine offers little relief of symptoms or hope for a cure (Alvarez-Nemegyei, Bautista-Botello, & Dávila-Velázquez, 2009; Yeh, Eisenberg, Davis, & Phillips, 2002). Prayer can be a positive coping strategy in the face of adversity (Crowther, et al., 2002). During times of desperation, people frequently turn to prayer for answers (Crowther, et al., 2002). Utilizing prayer appears to be a positive coping strategy in the face of adversity (Jarrett, 2007).

Health Care Providers and Prayer

In a 2009 study of CAM awareness among 63 neurosurgeons in the Washington State Association of Neurological Surgeons, neurosurgeons reported that their patients' use of CAM included prayer, acupuncture, herbs, massage therapy, and yoga (Wu, et al., 2009). These neurosurgeons reported that 25% of their patients prayed for their own health; 42% believed that spirituality and prayer may affect neurosurgery outcome (Wu, et al., 2009). Thirty-eight percent of the surveyed neurosurgeons reported that they pray for their patients (Wu, et al., 2009). Overall, 63% of neurosurgeons surveyed said that prayer and other CAM therapies have a role in neurosurgery (Wu, et al., 2009).

Because patients are either reluctant or forgetful when reporting their CAM use to their provider (Rhee, 2004), it falls to the provider to ask. Asking patients about CAM

use is important both because some CAM may improve health outcomes or emotional well-being, and because some CAM interfere with common medical therapies (Abbott, et al., 2010; Maclean, et al., 2003; Sleath, et al., 2008). While praying for health is unlikely to interact negatively with pharmaceutical therapies, as some CAM may, some patients may substitute prayer for conventional medical treatment, or their use of prayer may affect their adherence to medical regimens (Crowther, et al., 2002). However, many providers are either unaware of CAM therapies, or simply fail to ask about them (Rhee, 2004). The importance of health care providers being conversant in CAM to counsel their patients effectively was reported by the Medical School Objectives Project as early as 1998 (Wetzel, et al., 1998). In a study published in 2009, researchers found that over 60% of medical students were in favor of having more CAM-related study as part of their training (Abbott, et al., 2010). Currently practicing health care providers, in particular, need more CAM related training so they can appropriately counsel patients to coordinate use of conventional medicine and CAM (Abbott, et al., 2010), with prayer as the most frequently mentioned CAM used (Barnes, et al., 2004). Although training in CAM is increasingly offered by programs that train physicians, nurses and other health care providers, the level of quality and access has varied significantly (Abbott, et al., 2010). Many medical students do not view CAM therapies as being evidence based (Abbott, et al., 2010; Chaterji, et al., 2007). Interestingly, this perspective is particularly prevalent among first year medical students (Chaterji, et al., 2007), suggesting that more experienced medical students may gain insight into possible values of CAM for patient outcomes.

Older Americans' Use of CAM

Among older people, CAM is used most frequently for age-related chronic conditions such as cancer, depression, pain, and arthritis (Williamson, et al., 2003). As with the general population, the prevalence of CAM use is increasing in the older adult population (Astin, et al., 2000; Cherniack, et al., 2001; Eisenberg & Davis, 1998; Flaherty, et al., 2001). As of 2002, those aged between 50–59 years had the most extensive use of CAM (Barnes, et al., 2004). As America ages, the increasing proportion of older Americans is likely to increase the ranks of those who seek to both improve their quality of life and better manage their chronic health problems through CAM use (Williamson, et al., 2003). There are physiological factors for this increase in CAM use in the older population, including poor health, multiple health problems, and chronic disease (Cherniack, et al., 2001).

Race/Ethnicity and Prayer

Race and socioeconomic status do not define a person's spirituality (Crowther, et al., 2002); however, there are known racial/ethnic differences in religiosity, spirituality, end-of-life planning, and use of prayer (Phelps, 2009). Prayer is a venerated and much used healing CAM in African American populations (Brown, 2007). In a study conducted with data from the 2002 NHIS focused solely on African Americans, researchers found that prayer for health was the most frequently used CAM, twice as high as the use of other CAM (Brown, 2007). Prayer can be a positive coping strategy in the face of adversity. Researchers in one study found that minorities who incorporate spirituality have an improved quality of life, a decrease in symptoms, an increase in self-

esteem (Zittel-Palamara, Cercone, & Rockmaker, 2009). In another study focused on participants from minority groups, researchers found that turning to spirituality can produce an increased sense of hope, a boost to self esteem, a decrease in symptoms, and an improved quality of life. Spirituality contributed importantly to African Americans' survival in slavery, and remains an important source of strength (Sistler, Sistler, & Kimberly, 1999).

Spirituality, Prayer, and Health

Religious practice and spirituality are not the same thing. Koening defines spirituality as a relationship with sacred or transcendent powers, and as a personal quest for understanding answers to ultimate questions about life (Koenig & McCullough, 2000). As a hospice nurse emphasizes, spirituality encompasses much more than religious practice (Kehoe, 2006). In a study of hospice nurses, nurses were explicit about their avoidance of equating religion with spirituality (Kehoe, 2006). In one study of CAM, spirituality differed markedly from religiosity (Smith, et al., 2008). Spirituality has been defined as an inward and personal experience that differs from a structured religion (Smith, et al., 2008). Religiosity, on the other hand, generally has focused on organized religion, such as church participation or participation in other faith-based communities, which may not necessarily be spiritual (Smith, et al., 2008). Crowther notes in her 2002 study that, spirituality is an important component of health among older adults (Crowther, et al., 2002); Crowther also suggests integrating a spiritual dimension in care for older adults would be a promising way to promote successful aging (Crowther,

et al., 2002). In her 1993 paper, Zerwekh tells us that recognizing spiritual issues brings a greater awareness of struggles with the meaning of life (Zerwekh, 1993).

Role of Religion in Health

Many people turn to religion to cope with adversity. Koenig defines religion as "an organized system of beliefs, practices, rituals and symbols designed (a) to facilitate closeness to the sacred or transcendent (God, higher power, or ultimate truth/reality), and (b) to foster an understanding of one's relation and responsibility to others in living together in a community" (Koening & McCullogh, 2000, p. 18). A 2000 study found that religious involvement was associated with a greater sense of well-being and life satisfaction, more hope and optimism, less depression and drug abuse, and an overall greater purpose and meaning in life (Crowther, et al., 2002; Koenig & McCullough, 2000). Religious coping is a method where patients employ their religious beliefs to understand and adapt to stressful situations outside their control (Phelps, 2009). Positive religious coping, characterized by a constructive reliance on faith where one is assured that the spirit being prayed to is a loving and caring entity, differs widely from the less reported negative religious coping that can be viewed as divine retribution (Phelps, 2009). Studies have shown that among individuals with a chronic physical disability that does not respond to conventional medicine, their level of religious commitment can help to estimate time for recovery from depression (Koenig, et al., 1998). Studies have found an association between prayer for health and the reduction in disability and disease (Crowther, et al., 2002). Among AIDS patients, those who are more involved in religious activities have demonstrated measurably stronger immune function than others (Woods,

Antoni, & Ironson, 1999). A 1998 Stanford study reported that those patients with breast cancer with greater religious expression show better immune functioning compared with those with little or no religious expression (Schaal, Sephton, Thoreson, & Koopman, 1998). Religious involvement can promote greater well-being and life satisfaction (Koenig & McCullough, 2000). Religiousness can also an offer a sense of meaning, control, and comfort to people facing life threatening illness (Pargament, Koenig, & Perez, 2000; Phelps, 2009).

Role of Religion in Health – Possible Adverse Effects

"Religious copers" may choose to delay or deny medical treatment in the hopes that a miracle will heal them. Alternatively, they may employ aggressive, expensive, or experimental therapies in the belief that the therapy could be God's method of providing divine healing (Phelps, 2009). When an aggressive treatment with a small likelihood of success is an option, some religious copers may view choosing palliative care instead as not giving God a chance (Sulmasy, 2006). It is possible that these religious copers will choose to undergo high risk therapies with uncertain benefits in the belief that God could heal them through the hands of skilled surgeons (Phelps, 2009).

It is useful for providers of health and social services and patients alike to recognize that trusting a higher power to perform a healing miracle through prayer may delay use of medical services, or even lead to a refusal to use them (Hull, Daaleman, Thaker, & Pathman, 2006; Khraim, Scherer, Dorn, & Carey, 2009; Vess, Arndt, Cox, Routledge, & Goldenberg, 2009). For example, a study of Jordanian men and women (n=134) found that denial and prayer were the first responses to symptoms of acute

myocardial infarction (Khraim, et al., 2009). In a study using secondary data analysis from a random telephone survey of rural adults the American South, women and those who rated their health as poor are more likely to turn to faith based healing than conventional care in comparison to men and those who rate their health as good (Hull, et al., 2006). One study attributes the fact that African American women are 25% more likely than White women to have late stage breast cancer at initial diagnosis, and 20% more likely to die from the disease, to spiritual and religious beliefs that delay seeking health care (Gullatte, 2006).

A greater level of religiosity can be a major barrier to rationally addressing end-of-life issues. Faith based refusals of medical care are common in certain faiths (Vess, et al., 2009). In one study, religious cancer patients were more likely to think a do-not-resuscitate order was morally wrong (Phelps, 2009). What Phelps called "positive religious coping" can produce negative medical outcomes. Delaying or denying medical intervention in the hopes of a miracle, or seeking guidance from God rather than using medical solutions such as resuscitation, ventilation, and hospitalization in near-death situations, can all be included in Phelps's "positive religious coping" (Phelps, 2009). This delay and denial approach can have disastrous results on the patient and their family. Additionally, "positive religious coping" is reported to be a significant predictor of intensive, and expensive, life-prolonging care (Phelps, 2009).

The NHIS does not include questions about religious participation, religious affiliation, or level of religiosity and/or spirituality. We recognize the lack of these measures as a limitation of this research.

Barriers to Conventional Medicine and Recommendations

The literature review for the second area of study follows:

Use of CAM When Conventional Medicine Is Viewed as Being Ineffective

Americans are increasingly using CAM because they are dissatisfied with conventional medicine (McCaffrey, et al., 2007). People frequently turn to CAM when conventional medicine is inadequate to treat pain or chronic diseases (Astin, 1998). In one study using data from the 2002 National Health Interview Survey (NHIS), researchers found that one-third of all the survey participants used CAM because conventional medicine did not help (Grahm, 2005). In another study, 12% of people with multiple sclerosis (n=1573) indicated that they used CAM because conventional medicine did not help (Schwarz, Knorr, Geiger, & Flachenecker, 2008). Arthritis and many other forms of chronic pain are common among older adults, and frequently resistant to conventional pain medication (Barnes, et al., 2004; Cherniack, et al., 2001). More than one third of survey respondents in a national telephone survey of women aged 18 years and older, conducted in four languages (n=3172), indicated their reason for using CAM was side effects or ineffectiveness of conventional medicine (Chao, 2006). Chao found that negative side effects or ineffectiveness of conventional medicine were two reasons that turned users to CAM (Chao, 2006). One-quarter of the women in Chao's study used CAM because conventional medicine did not work (Chao, 2006). In an age-stratified cross-sectional survey of adults ages 65 and older who lived in the community (n=1200), 29% indicated that they used CAM because conventional medication did not control pain; 6% that conventional medicines had too many adverse side-effects; and 2% that

conventional medical system was not helpful (Cheung, et al., 2007).

Conventional Medicine was too Expensive

The White House Commission reported that underserved populations often use CAM because they cannot afford conventional medicine (WHCCAMP, 2002). People often use CAM as a substitute for conventional medicine, or in conjunction with it, because they want to avoid the high cost of medication (Cuellar & Aycock, 2003). In a national telephone survey of 3172 women inquiring of their CAM use, 14% reported they used CAM because conventional medicine was too expensive (Chao, 2006). Grahm analyzed data from the NHIS 2002 Alternative Health component and found that Hispanics were particularly likely to say that they used CAM because conventional medical treatments were too expensive (Grahm, 2005).

CAM is increasingly used when conventional medical solutions are perceived as too expensive (Fox, 1997; McCaffrey, et al., 2007). In a series of 16 studies of people with HIV/AIDS, researchers found that those who substituted CAM for conventional medicine generally did so because conventional medicine was viewed as too expensive (Wootton, 2001).

Recommended by Health Care Providers

To balance the risks and benefits for patients with persistent or chronic problems, health care providers may often try a number of treatments to find the optimal solution for each patient (Chao, 2006). In a national telephone survey of 3,172 women, one third of White, Hispanic, and African American women reported recommendations from health care providers as a reason for using CAM (Chao, 2006). In a study of patients

with multiple sclerosis (n=1,573), researchers found that 16% of participants indicated that they used CAM because it was recommended by health care providers (Schwarz, et al., 2008). In a cross-sectional analysis of the American Cancer Society's longitudinal Study of Cancer Survivors-I, 69.3% of cancer survivors reported using dietary supplements after their cancer diagnosis; 47.3% said that they had received their information on dietary supplements from their health care providers (Ferrucci, 2009).

Recommended by Family, Friends, or Co-Workers

Consumers often make decisions about medical treatment based on information from family and friends (Carman, et al., 2010). In a national telephone survey of 3,172 women aged 18 years and older, Choa found that Mexican American women were the most likely to use CAM because of family influence (Chao, 2006). In a survey of 1,573 adults with multiple sclerosis, 26% reported using a CAM because it was recommended by family or friends (Schwarz, et al., 2008). In Ferrucci's cross-sectional study of the American Cancer Society's 827 cancer survivors, 69.3% of which reported using dietary supplements after their cancer diagnosis, 37.5% used the dietary supplements at the recommendation of family or friends (Ferrucci, 2009).

CAM Use to Promote General Health and Well-Being

The literature review for the third area of my dissertation research follows.

CAM Use to Promote General health

A wide range of CAM types are used with the expectation that they will improve general health. Omega-3 fatty acids, exercise, and foliate are all CAM therapies that can benefit general health, generally with little risk (Freeman, 2009). Chiropractic care is

often used to improve general health and help adjust the spine and joints (Barnes, et al., 2008). Many Americans take a daily vitamin simply because they believe that it is good for their health (Oakley, 1998). Those who use CAM for general health are likely to combine use of CAM with conventional medicine. These CAM users believe that this combination improves their health and well-being (Eisenberg, et al., 2001; Patterson, et al., 2002).

A number of studies have found evidence that many adults use CAM with the expectation that it will maintain or improve health, or that it will treat health conditions. Responding to the 2002 NHIS and its CAM supplement, a sample representing 54.9% of adults said that CAM improves overall health when combined with conventional medical treatments (Barnes, et al., 2004). In a another study, researchers found that 63% of patients hospitalized with acute coronary disease used at least one CAM therapy for general health (Barraco, 2005). Using data from a survey of 1,597 older residents of California who were enrolled in a Medicare plan that covered acupuncture and chiropractic medicine, researchers found that 14% used acupuncture, 15% used massage, 20% used chiropractic services, and 24% took an herbal supplement to promote general health (Astin, et al., 2000). Using data from a telephone survey of cancer patients from the population-based Cancer Surveillance System of western Washington state (n=356), researchers found that 83% to 97% of patients reported that they used alternative medicine for general health and well-being (Patterson, et al., 2002). In another telephone survey of alternative therapies for cognitive problems among patients in a dementia clinic in Canada, researchers found that 29% reported using alternative medicines to improve

general health (Hogan, 1996). In another study of 158 clients of an Australian clinic, researchers found that about half of participants gave general health issues as the reason they visited a complementary health care clinic; 74% of participants said that they use CAM primarily to improve their health (D'Crus, 2005). In a study of people randomly selected from the Minnesota Driver's License registry (n=1200), researchers found that 74% of respondents used CAM to maintain general health (Cheung, et al., 2007). In a cross-sectional survey of residents of Hamilton-Wentworth, Ontario (n=5,416), researchers found that 37% reported using CAM; the most common reasons given for CAM use were for arthritis, fatigue, and general health (Lewis, 2001).

There is some evidence for the efficacy of CAM. In a recently published study using a randomized controlled trial of patients with fibromyalgia, researchers found that the 33 patients who received a Tai Chi intervention for 12 weeks had significant improvements in mood, quality of life, and general health compared with the patients in the control group (n=33) (C. Wang, Schmid, C.H., Rones, B.S. Kalish, R., 2010). In a review of 77 studies analyzing the results of 66 randomized controlled trials of tai chi and qi gong with 6,410 participants, researchers found evidence that practice of tai chi or qi gong was associated with better bone strength, cardiopulmonary fitness, and quality of life (Jahnke, 2010).

Use of CAM to Promote Immune Function

As people age, there are major changes in hormones that can reduce the effectiveness of the immune system (Cherniack, Florez, & B., 2007). Many adults use CAM with the expectation that it will improve their immune system (Matthews,

Sellergren, Dezheng, List, & Fleming, 2007; Mueller, et al., 2008). Popular supplements used with the expectation of stimulating the immune system include beta carotene and Vitamin C (Sierpina, 2005). Ginseng has also been promoted for a purported ability to stimulate the immune system (Sierpina, 2005).

Some research suggests that CAM can enhance immune function, including massage, aromatherapy, and mindful exercise such as Tai Chi, yoga, meditation, or biofeedback (Gaylord, 2002). In one study of 206 patients ages 50 and over with a history of depression and discharged from a psychiatric hospital, participants said that they used megavitamins, yoga, diet and folk remedies to improve their immune system (Hsu, et al., 2009). In a cross-sectional study of 827 patients treated for cancer who participated in the American Cancer Society's longitudinal Study of Cancer Survivors, researchers found that 573 (69.3%) reported using dietary supplements; 51% of participants said that they used supplements specifically to improve immune system function (Ferrucci, 2009).

Some research suggests that relaxation techniques may help to enhance immune function (Jacobs, 2001; Mamtani, 2002). In a review of studies of CAM use by people with asthma, researchers found evidence that relaxation, meditation and bio-feedback may have positive effects on the immune system (Markham, 2004).

Use of CAM to Improve Physical Performance

CAM used to improve physical performance includes herbal or dietary supplements, and physical manipulation such as massage or yoga. Research indicates

that adults use both forms of CAM with the expectation that they may improve physical performance.

Some research suggests that some types of CAM may improve physical performance. In a small study of patients with chronic obstructive pulmonary disease (*n*=29; average age 70), researchers found that a 12-week yoga program improved both exercise performance and self-reported functional performance (Donesky-Cuenco, 2009). In a case-control study, 28 women with osteoarthritis in the knee were randomly assigned to either in an eight week course on *Baduanjin*, a traditional Chinese exercise, or in a control group; compared with the control group, women in the *Baduanjin* group had significant improvements in aerobic ability and improved overall physical function (Bingchen, et al., 2008). *T'ai Chi Chuan* is a form of exercise that is widely practiced by older adults in Taiwan. In a study conducted with 140 older adults, researchers found that those who regularly practiced *T'ai Chi Chuan* had better physical functioning compared with those in the control group (Tsung-Jung, et al., 2007). In study with 19 women with hyperkyphosis, 58% reported improvement in their physical functioning after participating in (Greendale, McDivit, Carpenter, Seeger, & Huang, 2002).

In a double-blind prospective clinical trial, 20 older adults in good health received cordyceps sinensis, a natural herbal medicine used for centuries in China to preserve health and improve energy, or a placebo for 12 weeks. Those who received cordyceps sinensis had better physical performance, as measured using a stationary bike, than those who received the placebo (Chen, 2010). In a meta-analysis focused on use of supplemental Vitamin D in eight randomized controlled trials (n = 2,426), researchers

found that the likelihood of falls among older adults who received Vitamin D supplements was reduced by 19% (Bischoff-Ferrari, 2004).

Use of CAM to Enhance Energy

Lack of energy is a common complaint among older Americans, especially patients recovering from cancer. However, few studies have examined CAM use specifically to improve energy. In a survey of CAM use among 179 Hispanic adults recruited from a hospital in Southern California, 39% reported using alternative medicine with the expectation that it would improve their energy (Mikhail, Wali, & Ziment, 2004). As for potential efficacy, in a cross-sectional study of 827 patients who had been treated for cancer and participated in the American Cancer Society's longitudinal Study of Cancer Survivors, researchers found that 573 (69.3%) reported that they used dietary supplements; 44% patients said they used CAM to improve energy (Ferrucci, 2009).

Critical Synthesis of the Literature

A meta-analysis of the CAM literature shows that Americans use CAM and that CAM use is increasing. Prayer for health is the highest cited CAM; the prevalence for prayer for health has also increased over time. CAM use currently peaks at around age 50 to 55; thought there is some thought that as the baby boomers increase in age that this peak will increase commensurately. Reasons for using CAM vary but for the most part congregate around improving general health. There appears to be a general consensus that health care providers need to be better educated on CAM use, be better informed on potential interactions between CAM and conventional medicine, and be more proactive in asking their patients about what CAMs they are using. By the same token, curricula for

physicians, nurses, and other health care professionals need to provide a uniform and unbiased introduction to CAM, including both its potential benefits and limitations.

Gaps in the Literature

The literature review clearly shows that CAM is being used by Americans, that prayer for health is practiced especially by African Americans, women, people with chronic diseases, and people with low income. However, there is a distinct lack of literature on prayer for health as practiced by those aged 50 and older. Additionally, the reasons older Americans use CAM have not been well addressed in literature. Most of the literature on CAM use has focused broadly on the adult population, and has not addressed the unique reasons older Americans use CAM.

New Contributions

The focus of this research is to determine what reasons are given by older Americans for using CAM, and who is using prayer for health, for Americans age 50 and older. This dissertation will have three studies, resulting in three papers, to address this focus. All three studies will focus on CAM use with an emphasis on variations associated with gender, race/ethnicity and income.

The objective of the first study is to examine who is using prayer for health among older Americans. This first study focus is defined by the following research hypotheses: 1) African Americans will be more likely than Whites to pray for health. 2) Women will be more likely than men to pray for health. 3) Those with lower incomes will be more likely to pray for health than those with higher incomes.

The second study will address reasons for CAM use based on barriers and recommendations. The following research hypotheses shape and focus my study: 1) African Americans will be less likely to use CAM because it is recommended by a medical provider, compared to other races or ethnicities. 2a) Women will be more likely than men to use CAM because it was recommended by a health care provider, and 2b) women will be more likely to substitute CAM for conventional medicine than men. 3) Those with the highest incomes will be less likely to say that they use CAM because medical treatment is too expensive.

For the third study, addressing CAM use for health general health, the research is shaped by three hypotheses: 1) African Americans will be less likely than Whites to use CAM to improve: general health, immune function, physical health, and energy. 2) Women will be more likely than men to use CAM to improve: general health, immune function, physical health, and energy. 3) Those with higher incomes will be more likely to use CAM to improve general health, immune function, physical health, and energy than those with middle incomes.

Understanding older Americans' reasons for CAM use, and who does or does not use CAM, is an important first step in research. Such understanding could afford better training of our health care providers, and could improve targeting public service messages about the hazards of some types of CAM and the benefits of others. Men, African Americans, and in some cases those with lower incomes might benefit from a targeted information campaign on the benefits of certain CAM therapies that are useful and affordable. Women, who have the highest prevalence of chronic disease, could

benefit from targeted research on the potential efficacy, benefits or hazards that certain CAM and CAM-prescription combinations might have for the post- and peri- menopausal woman. To focus efforts and use research funds efficiently, it is in the public interest to understand which types of CAM are being used, by whom, and for what reasons.

CHAPTER 3: GENDER, RACE/ETHNICITY AND INCOME DIFFERENCES IN PRAYER FOR HEALTH AMONG OLDER ADULTS LIVING IN THE UNITED STATES: RESULTS OF A NATIONAL SURVEY

Introduction

People ages 50 and older are the largest consumers of medical services, including provider services, hospital services, and pharmaceuticals (Administration on Aging, 2010; Barnes, Powell-Griner, McFann, & Nahin, 2002; Mueller, et al., 2008). A substantial number of people may substitute prayer for medical services (Cuellar & Aycock, 2003). Prayer for health can affect individuals' decisions about: the timing of medical service use; hospitalization, ventilation, or resuscitation; palliative care and hospice use weighed against aggressive treatments with limited chances of success; and compliance with prescribed medical regimens (Phelps, 2009; Silvestri, et al., 2003; True, et al., 2005). Prayer for health may also notably affect individuals' coping ability and risk of depression accompanying serious illness, both of which are associated with health behaviors that influence healing—including sleep, diet, and physical activity (Crowther, et al., 2002). Thus, prayer for health is a complementary or alternative medicine that may substantially affect both health and the use of conventional medical services. Yet, few studies have examined use of prayer for health by Americans age 50 and older. Some schools that train physicians, nurses, and other health care professionals may have only recently begun to consider aspects of patient care beyond clinical solutions (Tilden, et al., 2004; Wetzel, et al., 1998). Identifying the prevalence of prayer for health could help develop curricula of programs that train health care professionals that better serve the

needs of older Americans, and may help health care providers to better serve health care consumers.

The National Center for Complementary and Alternative Medicine (NCCAM), a unit of the National Institutes of Health, defines Complementary and Alternative Medicine (CAM) as a group of health care systems and medical care practices and products not generally considered as conventional medicine. CAM is defined as complementary, alternative, or integrative medicine. Complementary medicine is used in conjunction with conventional medicine; alternative medicine is used in lieu of conventional medicine; integrative medicine combines traditional medicine and CAM (Barnes, et al., 2008). NCCAM has suggested that CAM be organized into four categories: (1) energy medicine, (2) manipulative and body-based practices, (3) biologically based practices, and (4) mind-body medicine (NCCAM, 2009b). Prayer is included in the mind-body category.

Use of CAM has increased substantially in the U.S. over at least the past few decades (Eisenberg & Davis, 1998). The National Health Interview Survey (NHIS) 2007 survey found that 38.3% of American adults used CAM, up from 36% reporting use in 2002; these estimates exclude vitamins and prayer (NCCAM, 2008). Eisenberg and colleagues found an almost 10% increase in CAM use between 1990 and 1997 (Eisenberg & Davis, 1998). Societal trends toward increasing participation in medical decision making since the late 1960s and early 1970s, and increased availability of medical information on the Internet, have contributed to this trend (McCaffrey, et al., 2007). It would be useful for health care policy makers to better understand how this

potential shift in CAM use in medical care is affecting health care delivery. Given the rise in CAM use, it is useful for policy makers to better understand CAM use as a market-driven service provision (McCaffrey, et al., 2007).

Study Objectives

The purpose of this study is to examine prayer for health, the CAM used most commonly by Americans (Arcury, et al., 2002; Astin, et al., 2000; Cherniack & Pan, 2002; Cherniack, et al., 2001). This study examines the prevalence of prayer among Americans age 50 and older, with a focus on differences associated with race/ethnicity, gender, and income.

Literature Review

Prevalence of CAM

Use of CAM has been steadily increasing in the United States. Nearly 40% of adults reported using CAM in a recent survey; this estimate excludes vitamins and prayer (NCCAM, 2008). Burke reported in 2006 that 36% of respondents in a national survey reported using CAM in the past 12 months; when prayer for health was included that figure rose to 62% (Burke, et al., 2006). Among cancer survivors, CAM use is estimated to be as high as 83% (Mao, et al., 2007). Patients who report using CAM therapies say that using a CAM gives them a sense of control over their medical care (S. Wang, et al., 2003).

Prevalence of Prayer for Health

Use of prayer for health has increased since 1998 (Grahm, 2005). In reviewing the NHIS data for prayer in 2002, Barnes reported that in the past 12 months, about 45%

of adults prayed for health (Barnes, et al., 2008). Results from the 2002 NHIS Alternative Health Supplement revealed that prayer was one of the most used CAM (Grahm, 2005). For women with a genetic risk for breast cancer, spiritual healing and/or prayer was the most commonly reported CAM, at 48.8% (C. Mueller, et al., 2008). In a 2007 study examining CAM use and chronic fatigue illness, researchers found that 63.1% of the study participants reported praying for health (Jones, et al., 2007). Research suggests extensive CAM use among cancer survivors, with estimates as high as 83% when prayer is included (Mao, et al., 2007). Prayer is most frequently used for chronic conditions for which traditional medicine offers little relief of symptoms or hope for a cure (Alvarez-Nemegyei, et al., 2009; Yeh, et al., 2002). Prayer can be a positive coping strategy in the face of adversity (Crowther, et al., 2002). During times of desperation, people frequently turn to prayer for answers (Crowther, et al., 2002). Utilizing prayer appears to be a positive coping strategy in the face of adversity (Jarrett, 2007).

Health Care Providers and Prayer

In a 2009 study of CAM awareness among 63 neurosurgeons in the Washington State Association of Neurological Surgeons, neurosurgeons reported that their patients' use of CAM included prayer, acupuncture, herbs, massage therapy, and yoga (Wu, et al., 2009). These neurosurgeons reported that 25% of their patients prayed for their own health; 42% believed that spirituality and prayer may affect neurosurgery outcome (Wu, et al., 2009). Thirty-eight percent of the surveyed neurosurgeons reported that they pray for their patients (Wu, et al., 2009). Overall, 63% of neurosurgeons surveyed said that prayer and other CAM therapies have a role in neurosurgery (Wu, et al., 2009).

Because patients are either reluctant or forgetful when reporting their CAM use to their provider (Rhee, 2004), it falls to the provider to ask. Asking patients about CAM use is important both because some CAM may improve health outcomes or emotional well-being, and because some CAM interfere with common medical therapies (Abbott, et al., 2010; Maclean, et al., 2003; Sleath, et al., 2008). While praying for health is unlikely to interact negatively with pharmaceutical therapies, as some CAM may, some patients may substitute prayer for conventional medical treatment, or their use of prayer may affect their adherence to medical regimens (Crowther, et al., 2002). However, many providers are either unaware of CAM therapies, or simply fail to ask about them (Rhee, 2004). The importance of physicians being conversant in CAM to counsel their patients effectively was reported by the Medical School Objectives Project as early as 1998 (Wetzel, et al., 1998). In a study published in 2009, researchers found that over 60% of medical students were in favor of having more CAM-related study as part of their medical school training (Abbott, et al., 2010). Health care providers need more CAM related training so they can appropriately counsel patients to coordinate use of conventional medicine and CAM (Abbott, et al., 2010), with prayer as the most frequently mentioned CAM used (Barnes, et al., 2004). Although training in CAM is increasingly offered by medical schools, the level of quality and access has varied significantly (Abbott, et al., 2010). Many medical students do not view CAM therapies as being evidence based (Abbott, et al., 2010; Chaterji, et al., 2007). Interestingly, this perspective is particularly prevalent among first year medical students (Chaterji, et al.,

2007), suggesting that more experienced medical students may gain insight into possible values of CAM for patient outcomes.

Older Americans' Use of CAM

Among older people, CAM is used most frequently for age-related chronic conditions such as cancer, depression, pain, and arthritis (Williamson, et al., 2003). As with the general population, the prevalence of CAM use is increasing in the older adult population (Astin, et al., 2000; Cherniack, et al., 2001; Eisenberg & Davis, 1998; Flaherty, et al., 2001). As of 2002, those aged between 50–59 years had the most extensive use of CAM (Barnes, et al., 2004). As America ages, the increasing proportion of older Americans is likely to increase the ranks of those who seek to both improve their quality of life and better manage their chronic health problems through CAM use (Williamson, et al., 2003). There are physiological factors for this increase in CAM use in the older population, including poor health, multiple health problems, and chronic disease (Cherniack, et al., 2001).

Race/Ethnicity and Prayer

Race and socioeconomic status do not define a person's spirituality (Crowther, et al., 2002); however, there are known racial/ethnic differences in religiosity, spirituality, end-of-life planning, and use of prayer (Phelps, 2009). Prayer is a venerated and much used healing CAM in African American populations (Brown, 2007). In a study conducted with data from the 2002 NHIS focused solely on African Americans, researchers found that prayer for health was the most frequently used CAM, twice as high as the use of other CAM (Brown, 2007). Prayer can be a positive coping strategy in the

face of adversity. Researchers in one study found that minorities who incorporate spirituality have an improved quality of life, a decrease in symptoms, an increase in self-esteem (Zittel-Palamara, et al., 2009). In another study focused on participants from minority groups, researchers found that turning to spirituality can produce an increased sense of hope, a boost to self esteem, a decrease in symptoms, and an improved quality of life. Spirituality contributed importantly to African Americans' survival in slavery, and remains an important source of strength (Sistler, et al., 1999).

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Religious practice and spirituality are not the same thing. Koening defines spirituality as a relationship with sacred or transcendent powers, and as a personal quest for understanding answers to ultimate questions about life (Koenig & McCullough, 2000). As a hospice nurse emphasizes, spirituality encompasses much more than religious practice (Kehoe, 2006). In a study of hospice nurses, nurses were explicit about their avoidance of equating religion with spirituality (Kehoe, 2006). In one study of CAM, spirituality differed markedly from religiosity (Smith, et al., 2008). Spirituality has been defined as an inward and personal experience that differs from a structured religion (Smith, et al., 2008). Religiosity, on the other hand, generally has focused on organized religion, such as church participation or participation in other faith-based communities, which may not necessarily be spiritual (Smith, et al., 2008). Crowther notes in her 2002 study that, spirituality is an important component of health among older adults (Crowther, et al., 2002); Crowther also suggests integrating a spiritual dimension in care for older adults would be a promising way to promote successful aging (Crowther,

et al., 2002). In her 1993 paper, Zerwekh tells us that recognizing spiritual issues brings a greater awareness of struggles with the meaning of life (Zerwekh, 1993).

Role of Religion in Health

Many people turn to religion to cope with adversity. Koenig defines religion as "an organized system of beliefs, practices, rituals and symbols designed (a) to facilitate closeness to the sacred or transcendent (God, higher power, or ultimate truth/reality), and (b) to foster an understanding of one's relation and responsibility to others in living together in a community" (Koening & McCullogh, 2000, p. 18). A 2000 study found that religious involvement was associated with a greater sense of well-being and life satisfaction, more hope and optimism, less depression and drug abuse, and an overall greater purpose and meaning in life (Crowther, et al., 2002; Koenig & McCullough, 2000). Religious coping is a method where patients employ their religious beliefs to understand and adapt to stressful situations outside their control (Phelps, 2009). Positive religious coping, characterized by a constructive reliance on faith where one is assured that the spirit being prayed to is a loving and caring entity, differs widely from the less reported negative religious coping that can be viewed as divine retribution (Phelps, 2009). Studies have shown that among individuals with a chronic physical disability that does not respond to conventional medicine, their level of religious commitment can help to estimate time for recovery from depression (Koenig, et al., 1998). Studies have found an association between prayer for health and the reduction in disability and disease (Crowther, et al., 2002). Among AIDS patients, those who are more involved in religious activities have demonstrated measurably stronger immune function than others (Woods,

et al., 1999). A 1998 Stanford study reported that those patients with breast cancer with greater religious expression show better immune functioning compared with those with little or no religious expression (Schaal, et al., 1998). Religious involvement can promote greater well-being and life satisfaction (Koenig & McCullough, 2000). Religiousness can also an offer a sense of meaning, control, and comfort to people facing life threatening illness (Pargament, et al., 2000; Phelps, 2009).

Role of Religion in Health – Possible Adverse Effects

"Religious copers" may choose to delay or deny medical treatment in the hopes that a miracle will heal them. Alternatively, they may employ aggressive, expensive, or experimental therapies in the belief that the therapy could be God's method of providing divine healing (Phelps, 2009). When an aggressive treatment with a small likelihood of success is an option, some religious copers may view choosing palliative care instead as not giving God a chance (Sulmasy, 2006). It is possible that these religious copers will choose to undergo high risk therapies with uncertain benefits in the belief that God could heal them through the hands of skilled surgeons (Phelps, 2009).

It is useful for providers of health and social services and patients alike to recognize that trusting a higher power to perform a healing miracle through prayer may delay use of medical services, or even lead to a refusal to use them (Hull, et al., 2006; Khraim, et al., 2009; Vess, et al., 2009). For example, a study of Jordanian men and women (n=134) found that denial and prayer were the first responses to symptoms of acute myocardial infarction (Khraim, et al., 2009). In a study using secondary data analysis from a random telephone survey of rural adults the American South, women and

those who rated their health as poor are more likely to turn to faith based healing than conventional care in comparison to men and those who rate their health as good (Hull, et al., 2006). One study attributes the fact that African American women are 25% more likely than White women to have late stage breast cancer at initial diagnosis, and 20% more likely to die from the disease, to spiritual and religious beliefs that delay seeking health care (Gullatte, 2006).

A greater level of religiosity can be a major barrier to rationally addressing end-of-life issues. Faith based refusals of medical care are common in certain faiths (Vess, et al., 2009). In one study, religious cancer patients were more likely to think a do-not-resuscitate order was morally wrong (Phelps, 2009). What Phelps called "positive religious coping" can produce negative medical outcomes. Delaying or denying medical intervention in the hopes of a miracle, or seeking guidance from God rather than using medical solutions such as resuscitation, ventilation, and hospitalization in near-death situations, can all be included in Phelps's "positive religious coping" (Phelps, 2009). This delay and denial approach can have disastrous results on the patient and their family. Additionally, "positive religious coping" is reported to be a significant predictor of intensive, and expensive, life-prolonging care (Phelps, 2009).

The NHIS does not include questions about religious participation, religious affiliation, or level of religiosity and/or spirituality. We recognize the lack of these measures as a limitation of this research.

NCCAM Definition of Prayer

Prayer is included among the mind-body CAM therapies defined by the NCCAM (NCCAM, 2008). In a study conducted by Brown et al. (2004) using data from the 2002 NHIS, prayer was identified as the most common CAM therapy (Barnes, et al., 2004). Prayer is a CAM frequently used by older adults (Arcury, et al., 2002; Astin, et al., 2000; Barnes, et al., 2004; Cherniack & Pan, 2002; Cherniack, et al., 2001; Cuellar & Aycock, 2003). "Spiritual healing" with the intention of promoting healing or self-healing includes the use of prayer, meditation, and the "laying on of hands" (Cleland, et al., 2006).

Theoretical Model and Hypotheses

Theoretical Model

This study uses the Andersen model as a framework to guide the research. The Andersen model was developed to study factors that contribute to use of acute care health services (Andersen, 1973). The model proposes that health services use is determined by three factors: predisposing factors, enabling factors, and need factors (J. N. Laditka, 2003). Predisposing factors include demographic characteristics and social structure elements. Enabling factors include family and community elements. Need factors include perceived and actual health needs. The Andersen model provides a useful framework for analyzing motivations for CAM use, including prayer for health (Barnes, et al., 2008; Brown, 2009).

Research Objectives and Hypotheses

The objective of this study is to examine how prayer for health by older Americans is used, focusing on differences by race/ethnicity, gender, and income, using

the Andersen model as a conceptual framework for the analysis. The findings will contribute new knowledge regarding older Americans' CAM use. Using a nationally representative survey of Americans conducted in 2007, and focusing on women and men age 50 and over, the hypotheses are:

1. African Americans will be more likely than Whites to pray for health.

(1) There has been and continues to be a power differential between African Americans and Whites, as demonstrated by unequal (lower) pay for equal work, and the lack of African Americans in positions of power (Ellison & Taylor, 1996; Wilkinson, Saper, Rosen, Welles, & Culpepper, 2008). Prayer is one way African Americans can appeal to a higher power. Prayer is a behavioral response African Americans have employed in response to racism (Barksdale, Farrug, & Harkness, 2009). (2) Spirituality and prayer have been a major contributing factor in the survival of African Americans since they were brought to the United States as slaves. (3) African Americans face an accumulation of cultural disadvantages and discrimination not seen in other race/ethnicities, possibly contributing to their strong reliance on prayer and spirituality (Brown, 2006; Ellison & Taylor, 1996)

2. Women will be more likely than men to pray for health.

(1) There has been and continues to be a power differential between women and men as demonstrated by unequal (lower) pay for equal work, and the still present "glass ceiling" effect (Berry & Franks, 2010; Coleman, 2010; Hoobler, Wayne, & Lemmon, 2009). Prayer is one way women can ask for help. (2) Women are more likely to have chronic conditions than men (Saydah & Eberhardt, 2006). Some chronic conditions and

some cancers do not have effective or pleasant treatments; prayer for health is a way getting comfort and hope where little hope and comfort is offered by conventional medicine. (3) Women may be more comfortable than men asking others for help.

3. Those with lower income will be more likely to pray for health than those with higher income.

(1) Some people with limited resources pray as a coping mechanism(Andersson, 2008). (2) Lower status groups such as women, African-Americans, and poorer individuals are more likely to pray than other groups (Baker, 2008). (3) Being poor or of lower status leads to attempts to secure otherworldly compensation or help (Baker, 2008; Kilbourne, Cummings, & Levine, 2009).

Design and Methods

Conceptual Framework

The conceptual model used is based on the Andersen behavioral model of health service use. The Andersen model use is both well known and has recently been extended to use of CAM (Brown, 2009; Goldsmith, 2002). The model hypothesizes that use of health services is a function of thee items: 1) societal factors, 2) health services system factors, and 3) individual factors (Bradley, et al., 2002; Goldsmith, 2002; J. N. Laditka, 2003). This model is based on characteristics that predispose users to choose certain services, enable them to use those services, and establish a need to use those services (J. N. Laditka, 2003). The model is shown in Figures 1 and 2.

Individual factors in this model are categorized as need factors, enabling factors, and predisposing factors (Bradley, et al., 2002; J. N. Laditka, 2003). Predisposing factors

include both demographic and social structure indicators. Enabling factors encompass community and family indicators. Need factors include perceived and evaluated need (Bradley, et al., 2002).

Dependent Variable

The dependent variable is "invoked prayer for health," a dichotomous variable made up of two variables: ever asked others to pray for your own health in the past 12 months, and ever prayed for your own health in the past 12 months.

Covariates

All variables have been coded or re-coded to be dichotomous variables. Categorical variables are expressed in the model using a dummy variable to indicate each category. Referent groups are chosen to serve as the best point of comparison (Hardy, 1993). The general guideline used for selecting the referent category is to choose the category with greatest number of observations. This decision rule was used for the following variables: race/ethnicity, insurance, age, marital status, education, income, weight, health status, self-reported health, and region. For the income-to-need ratio, the mid-point was judged to provide the best point of comparison. Thus, individuals with higher or lower incomes are compared to the mid-point.

Predisposing indicators are generally separated into two groups: demographic characteristics and social structure.

Predisposing / demographic indicators include age, sex, and marital status (Bradley, et al., 2002; J. N. Laditka, 2003). For sex, men are the referent group. Age has been re-coded into 5-year age ranges, consistent with other studies that analyze

differences in CAM use by age cohorts. This categorization limits the possibility of residual confounding while permitting the identification of any notable non-linearities in the results. The referent category for age is 50 to 55. Marital status was divided into four categories: never married; married; separated, divorced, or widowed; and marital status unknown. The referent category for marital status is married. Use of these variables is consistent with other studies (Andersen, 1973; J. N. Laditka, 2003).

Predisposing / social structure indicators include education and race/ethnicity. Education is divided into seven groups based on years of education completed: grade 8 or less; grades 9 to 12; high school diploma; associate degree; bachelor's degree; MS, MD, or PhD; and education missing. The referent category is completion of high school. Race/ethnicity is characterized by five groups: Hispanic, Asian, non-Hispanic African American (hereafter referred to as African American), other, and non-Hispanic White (hereafter referred to as White). White is the referent category. Individuals who reported both Asian and Hispanic ethnicity were categorized as Hispanic.

Enabling factors encompass such elements as community and family. Community is represented in these data by region of the country. Family indicators include income level and health insurance (Andersen, 1973; Bradley, et al., 2002; J. N. Laditka, 2003)

Enabling / Family. The family indicator of income level is the income-to-need ratio. An income-to-need ratio variable is included in the logistic regression models to control for differences in family income. Following a standard definition used in economic analyses, the income-to-need ratio is calculated using family size, total

household income, and household makeup (such as the number of children and older adults, where both groups are presumed to consume fewer resources), and adjusted for annual cost of living using federal poverty guidelines (U. S. Census Bureau, 2009). Individuals with an income-to-need ratio of 1 have exactly the income that defines the federal poverty threshold for someone in similar family circumstances. Those with an income-to-need ratio of 2 have twice that level of income. The income-to-need ratio is divided into five groups: < 1, 1 to <2, 2 to <3, 3 to <4, 4 to <5, and 5+, with <1 being the poorest and 5+ being the wealthiest. The referent category for income-to-need is 3 to <4. Health insurance is grouped into seven categories: dual eligibility for individuals enrolled in Medicaid and Medicare; Medicaid only; Medicare only; Medicare Plus, which identifies Medicare beneficiaries who also have supplemental medical insurance; other public health insurance; private health insurance; and uninsured. Private health insurance is the referent category. The presence or absence of health insurance and the quality/type of health insurance is associated with health status, an effect that crosses all sociodemographic borders (Franks, Clancy, & Gold, 1993).

Enabling / Community Characteristics. The only community factor with a measured variable in this study is region of the country (Wennberg, Fisher, & Skinner, 2002). Region has been found to be a contributing factor in Medicare costs and service use (Wennberg, et al., 2002). Identified regions are: Northeast, Midwest, West, and South. The South is the referent category.

Need is comprised of an individual's health and functional capacity, both as perceived by the individual and as evaluated by medical practitioners (Bradley, et al.,

2002; J. N. Laditka, 2003). Perceived need includes perceived state of health as compared to last year, and current health perceptions. Evaluated need requires professional judgment and objective measurements (Bradley, et al., 2002).

Need / Perceived Good Health is represented by self reported health status. Self reported health is an indication of how the person feels about her or his health currently. This variable has two categories: 1) excellent, very good health, or good health, and 2) fair or poor health. The referent category includes three levels of self reported health: excellent, very good, and good. Health status compares a person's health on the day of interview with her or his overall health one year earlier. It is divided into four sub-categories, comparing current health status to last year's health status: better, same, worse, or missing, with "same" as the referent category.

Need / Evaluated Health factors include both chronic conditions and health risks. Health risks include: current smoker and weight categories. Weight categories are subdivided into four groups using body mass index (BMI) cut points as defined by the Centers for Disease Control and Prevention (CDC): underweight, normal weight, overweight, and obese. An additional dummy variable represents individuals with missing BMI information. Normal weight is the referent category.

Eight chronic conditions were included: musculoskeletal, endocrine and metabolic, circulatory, depression, weight problems, cancer, nervous, memory and cognition problems. Each of these conditions was coded based on a set of variables relating to the given condition. For example, an individual was considered to have cancer if she or he reported that cancer caused difficulty with activities, or cancer caused any

limitation, or that she or he had ever been told by a doctor that she or he had cancer. Table 1 shows a summary of the coding for the eight chronic conditions.

Overview of the National Health Interview Survey (NHIS)

The National Health Interview Survey (NHIS) is a nationally representative survey conducted annually in the U.S. This survey collects information about use of medical services, health status, and other health measures reported by survey participants. This survey has been conducted annually in the U.S. since 1963. The NHIS is conducted continuously throughout each year. It is a cross-sectional, multistage household survey (NHIS, 2009).

The NHIS is conducted by the National Center for Health Statistics (NCHS). The NCHS operates under the auspices of the CDC. The main objective of the NHIS is to monitor the health of the United States population (NHIS, 2009). The NHIS is a principal source of health information on the civilian, non-institutionalized population of the United States. Survey exclusions include those who are incarcerated, patients in long-term care facilities, people on active duty with the Armed Forces, and any U.S. nationals living abroad. Dependents of individuals in excluded categories may be included in the survey (NHIS, 2009).

NHIS Survey Structure

The NHIS surveys are in-person, confidential interviews. "Core questions" are similar questions that are asked every year (NHIS, 2009). The NHIS follows a sampling plan with a multistage area probability design (NHIS, 2009). This design allows for representative sampling of both households and non-institutional group quarters (e.g.,

college dormitories). Following every decennial census, the sampling plan is redesigned (NHIS, 2009). The last redesign, which occurred in 2006, had many similarities to the previous sampling plan (NHIS, 2009).

The creation of Primary Sampling Units (PSU's) is the first stage of NHIS (NHIS, 2009). A PSU is a geographical grouping pulled from a county, a small group of contiguous counties, or a metropolitan statistical area (NHIS, 2009). NHIS uses 428 PSU subsets of the U.S., including the 50 States and the District of Columbia (NHIS, 2009). There are two types of second-stage units within each PSU: permit segments and area segments (NHIS, 2009). Area segments are geographically defined and contain eight, twelve, or sixteen addresses; whereas permit segments include all housing units built after the 2000 census (NHIS, 2009).

Hispanics and African Americans are over sampled. The NHIS also began over sampling Asian Americans starting with the 2006 survey (NHIS, 2009).

Screening and segmentation are two of the over sampling procedures (NHIS, 2009). Screening entails randomly separating address segments into two parts, one assigned to be screened for the inclusion of one or more African American, Asian, or Hispanic persons (NHIS, 2009). If no such person exists, the interview is ended and marked "screened out." Segmentation is the second over sampling procedure (NHIS, 2009). Segments with higher concentrations of African American, Asian, and Hispanic persons per the 2000 census are sampled at a higher rate (NHIS, 2009). Full interviews occur at all households. The NHIS sample is then further subdivided into four nationally representative sub-designs allowing for reduction in data collection without impinging on

the quality and flexibility of the total sample size (NHIS, 2009). With no sample cuts, the expected NHIS sample size is approximately 35,000 households containing about 87,500 persons (NHIS, 2009). Survey participation is both confidential and voluntary. The annual response rate is close to 90% (NHIS, 2009).

Composition of the NHIS Questionnaire

The NHIS questionnaire is made up of core questions, a basic set of questions regarding health, and demographic items (NHIS, 2009). In addition to the core questions, each year there are three components: 1) a Household component, which collects limited demographic information on all individuals living in the household; 2) a Family component, which verifies and collects additional information about the access and utilization of health care, health limitations, injuries, health status, insurance, income and assets; and 3) Sample Adult and Sample Child components (NHIS, 2009). The Sample Adult and Sample Child components are comprised of one participant randomly selected from the Sample Adult Core and Sample Adult Child questionnaires (NHIS, 2009).

Each year, supplemental questionnaires are included in the survey. These supplements may be included onetime only, or asked on a rotating basis. The Complementary and Alternative Health supplement was conducted in 2002 and 2007, with a small pilot questionnaire included in the 1997 survey (NHIS, 2009).

Data are collected by approximately 400 trained interviewers employed by the U.S. Bureau of the Census, in personal household interviews (NHIS, 2009). All adult members of the household aged 17 or older who are at home at the time of the interview are invited to participate for the Family Core component (NHIS, 2009). Information for

children and for adults not at home during the interview may be collected by a responsible adult family member aged 18 and over (NHIS, 2009).

NHIS Survey Components

This study uses three components from the 2007 National Health Interview Survey. These components are the Family component, the Sample Adult component, and the Complementary and Alternative Health component (NHIS, 2009). A total of 23,393 adults age 18 and over responded to the CAM supplement; the response rate was 68.7% (Barnes et al., 2008). The Complementary and Alternative Health component contains over 3,000 variables describing the use, use frequency, and intended purpose for use of 36 individual CAM (NHIS, 2009).

Ethical Considerations

The data are de-identified. The study has been approved by the Institutional Review Board (IRB) at the University of North Carolina at Charlotte. All data are de-identified and freely available to any interested party at the website of the National Center for Health Statistics.

Older Americans Defined

Using age 50 and over as an inclusion criterion for this research is consistent with established approaches to defining older populations, especially in the context of health promotion or disease prevention specifically regarding chronic diseases and cognitive problems (CDC, 2007). Age is a risk factor for many chronic diseases, including heart problems, hypertension, dementia and arthritis (National Cancer Institute, 2009). The National Cancer Institute (NCI) notes that a woman's chance of getting breast cancer

increases with age. NCI uses age 50 as a cut-point for identifying elevated risk for breast cancer (National Cancer Institute, 2009).

Statistical Analysis

This was a cross-sectional study where exposure and disease status were simultaneously assessed, using data from the 2007 NHIS. Analyses included descriptive, bivariate, and multiple logistic regression. All analyses were weighted for national representation of population characteristics including race/ethnicity, gender, income, education, specific age groupings, and others (NHIS, 2009). Data analysis was conducted using SAS 9.1 (Cary, NC), and accounted for the complex survey design. Variables were assessed for multicollinearity; there was no evidence that multicollinearity was sufficiently great to have affected the results meaningfully.

Results

Characteristics of the Sample

The weighted descriptive, nationally representative results from the 2007 National Health Interview Survey of Americans age 50 and older appear in Table 2. Those who are age 50 and older have a sample size of 10,096 (representing about 89.5 million older people); and those age 50 and older who prayed for health in the past 12 months (or, more precisely, those who prayed for health, including those who asked others to pray for their health) have a sample size of 5,765 (representing about 49.4 million older Americans). Table 2 shows information representing all Americans ages 50 and older (data columns at left), and information representing those ages 50 and older who used prayer for health (data columns at right). For both groups, results are shown for the

exposure and control variables. Table 2 shows the sample size (n), the weighted population size (N), the weighted percent for each category, and the confidence interval for the percent estimate. Except where noted, all results described below are weighted for national representation. All results refer to those ages 50 and older.

Women represented 53.8% of the total population, but 61.2% of those using prayer for health. These unadjusted results suggest that women were considerably more likely than men to use prayer for health. African Americans represented 9.8% of the total population, but 13.3% of those using prayer for health. Asians represented 3.7% of the total population, but only 2.9% of those using prayer for health. Hispanics represented 8.1% of the total population, but 9.8% of those using prayer for health. Whites represented 77.6% of the total population, but 73.0% of those who prayed for health. The combination of these results suggests that African Americans and Hispanics were more likely than other ethnicities to pray for health, and that Asians and Whites were less likely to do so. Those with an income-to-need ratio less than 1 were 8.8% of the total population, but 11.0% of those who used prayer for health. Those with an income-to-need ratio of 5 and over were 32.4% of the total population, but 27.6% of those using prayer for health. These results suggest that those with lower incomes are more likely to pray for health, whereas those with higher incomes are less likely to do so. There is evidence in these unadjusted results that there may be a gradient of decreasing likelihood of using prayer for health associated with increasing income. Those with a musculoskeletal condition were 49.2% of the total population, but 56.3% of those who used prayer for health. Those with a circulatory condition were 55.1% of the total

population, but 61.2% of those who used prayer for health. In these results, and for all of the chronic conditions, there is suggestive evidence that those with chronic conditions may be more likely to pray for health than those who do not have these conditions.

Unadjusted Results

Results of unadjusted logistic analyses of the likelihood of using prayer for health for the exposure variables are shown in Table 3. For each result, Table 3 shows the odds ratio (OR) and upper and lower bounds of the 95% confidence interval (CI) as well as the p-value. The odds that an African American would use prayer for health were almost 2.8 times as great as the corresponding odds for a White person (OR 2.79, CI 2.39-3.25). The odds that a woman would pray for health were almost twice as great as the corresponding odds for men (OR 1.94, CI 1.77-2.13). There was a distinct income gradient: compared with people with a mid-level of income, older people with less income were more likely to pray for health; older people with the highest incomes were less likely to pray for health.

Adjusted Results

Adjusted results are reported in Table 4, which shows the OR, the 95% CI, and p-value associated with each result. The adjusted odds that women would pray for health were 97% higher than the corresponding odds for men (OR 1.97, CI 1.78-2.19). The adjusted odds that an African American would pray for health were about 2.5 times those of Whites (OR 2.55, CI 2.16-3.03). The odds that a Hispanic individual would pray for health were 97% higher than the corresponding odds for Whites (OR 1.97, CI 1.59-2.44). The result for Asians was not statistically significant. Compared to those with an

income-to-need ratio of 3 to <4, the odds that those at or below the federal poverty threshold (income-to-need ratio <1) would pray for health were 47% higher (OR 1.47, CI 1.19-1.81). Similarly, the odds that those with an income-to-need ratio of 1 to <2 would pray for health were 26% higher (OR 1.26, CI 1.06-1.50). Finally, the odds that those with an income-to-need ratio of 2 to <3 would pray for health were 30% higher (OR 1.30, CI 1.10-1.54). The odds that those with an income-to-need ratio of 4 and above would pray for health did not differ significantly from the corresponding odds for those with an income-to-need ratio of 3 to <4, suggesting that individuals in these higher income groups are about equally likely to pray for health, although at lower rates than individuals in lower income groups.

Next, results for selected control variables are described. There were no statistically significant results associated with age. The odds that those who never married would pray for health were 34% lower as compared to those who are married (OR 0.66, CI 0.54-0.81). There were no statistically significant results associated with insurance status. Compared to those who live in the South, the odds of praying for health for those who live in the Northeast were 43% lower (OR 0.57, CI 0.49-0.68); those who live in the West had 40% lower odds of praying for health (OR 0.60, CI 0.52-0.70). Compared to those who perceived their health to be the same as last year, those who perceived their health to be better this year than last year had 41% higher odds of praying for health (OR 1.41, CI 1.23-1.62); those who perceived their health to be worse this year as compared to last year had 42% higher odds of praying for health (OR 1.42, CI 1.17-1.73). Those who smoked had 33% lower odds of praying for health (OR 0.67, CI 0.57-

0.79). There were no statistically significant results associated with BMI categories. Older adults who reported difficulty or limitation with the following conditions had higher odds of praying for health: musculoskeletal 43% higher odds (OR 1.43, CI 1.29-1.60); circulatory problems 32% higher odds (OR 1.32, CI 1.19-1.47); depression had 83% higher odds (OR 1.83, CI 1.30-2.58); cancer 36% higher odds (OR1.36, CI 1.18-1.56).

Discussion

This analysis examined the prevalence of prayer for health among Americans age 50 and older, together with association between prayer for health and gender, race/ethnicity, and income. Individuals between age 50 and 59 are the most extensive users of CAM in the general population (Barnes, et al., 2004; C. Mueller, et al., 2008). As America ages, the increasing proportion of older Americans is likely to increase the ranks of those who seek to both improve their quality of life and better manage their chronic health problems through CAM use (Williamson, et al., 2003). Additionally, one of the fastest growing groups in America are minorities, particularly Hispanics, Asian Americans, and African Americans (Loera, Reyes-Ortix, & Kuo, 2007).

Three hypotheses guided this research. The first hypothesis was that African Americans would be more likely to pray for health than Whites. The results provide strong evidence to support this hypothesis and are consistent with previous research (Baker, 2008; Barksdale, et al., 2009; Brown, 2007; Wilkinson, et al., 2008). The second expectation was that women would be more likely than men to pray for health. The results support this hypothesis and are consistent with previous research (Brems,

Johnson, Warner, & Roberts, 2006; Brown, 2007; Wilkinson, et al., 2008). The final hypothesis was that those with lower incomes would be more likely to pray for health than those with higher incomes. The results support this hypothesis and are consistent with previous research (Baker, 2008; Garrow & Egede, 2006; Ross, Hall, Fairley, Taylor, & Howard, 2008).

This study has several strengths. A major strength is the large sample size and the fact that the study was based on a random nationally representative sample of the US population, allowing estimation of results for a variety of subgroups. The large sample size allowed investigation of the association between CAM use in this population and self-reported health characteristics, such as health behaviors, chronic health conditions, income and health insurance coverage as related to prayer for health. The data also provided a useful set of measured variables to represent the theoretical constructs of the Andersen model, thus providing a reasonable set of controls for potential confounding (Brown, 2009). Limiting the prayer for health variable to the last 12 months rather than a measure of having "ever" prayed for health is also useful; shorter reference periods typically result in better recall and thus better data (Barnes, et al., 2008).

Several limitations exist as well. About 30% of participants in the NHIS declined to participate in the supplemental CAM survey. We acknowledge this participation rate as a potential source of bias. CAM users may have been more motivated than non-users to discuss CAM, and more likely to participate. Thus, although the specific CAM supplement was separately weighted for national representativeness, the use of CAM among participants in the CAM supplement may over-estimate prayer for health in the

general population. Data were self reported in structured interviews. No validation study was done on the data after collection. Recall error is a possibility regarding prayer; however, limiting the recall to “past year” versus “ever” is likely to limit this potential source of bias. It is important to acknowledge that this study makes no claims about the efficacy of prayer for health. As previously acknowledged, the NHIS does not include measures of religiosity or spirituality, church participation, or denomination. It may be that people who are more (or less) religious are more (or less) likely to pray for health. This would be a useful area for further study.

It is not surprising that the odds of praying for health were higher for many chronic conditions. As there are no cures for many chronic conditions, individuals with chronic conditions may be more likely to turn to prayer as a way of taking control. Also, since the South is known as the "Bible belt," this may account in part for the finding that people who live in the South are more likely to pray for their health than those living in other regions.

Implications for Policy, Practice, and Research

Findings from this study suggest that many older Americans pray for health, and also that there is considerable variation in the use of prayer for health, with African Americans more likely to pray for health than Whites, women more likely to pray for health than men, and people with lower incomes more likely to pray for health than those with higher incomes. Older Americans with chronic diseases such as depression, cancer, or arthritis and other musculoskeletal conditions pray for health much more commonly than do others.

In response to the new health care reform bill, The Patient Protection and Affordable Care Act, health care will increasingly be provided by interdisciplinary teams of health care providers including licensed complementary and alternative medicine practitioners (Patient Protection and Affordable Care Act, 2010). Coordination of care services, including CAM, will be provided for those who request it (Patient Protection and Affordable Care Act, 2010). As prayer is the most commonly cited CAM, prayer for health may be included in these services.

Based on the findings of this research, physicians, nurses, and other health care providers need to understand that many Americans pray for health. As such, it would be useful to offer some form of spirituality sensitivity training in curricula of schools for physicians, nurses, and other health care providers. Providing health care providers with additional CAM training, including awareness and sensitivity of patient's potential spiritual needs may help providers talk to patients about coordinating use of conventional medicine and prayer (Abbott, et al., 2010; Maclean, et al., 2003). It may be useful for providers to open the dialog on prayer for health with their patients, especially women, African Americans, those with chronic illness, and those with less income or with financial difficulties. One way health care providers and social workers can assess the importance of prayer to a patient is by asking general, open-ended questions, such as, "are there beliefs or practices that you use to manage your health that you would like to tell us about so we can better manage your care?" Although the efficacy of prayer for health has not been proven, it is useful for providers to recognize that a majority of older adults pray for health, particularly individuals with chronic conditions, limited financial

resources, women and African Americans. Recognition by health care providers of the prevalence and the potential importance of prayer to their patients may offer some comfort to those patients who need it most.

Figure 3.1: Conceptual Model: from Andersen & Newman (Andersen, 1973)

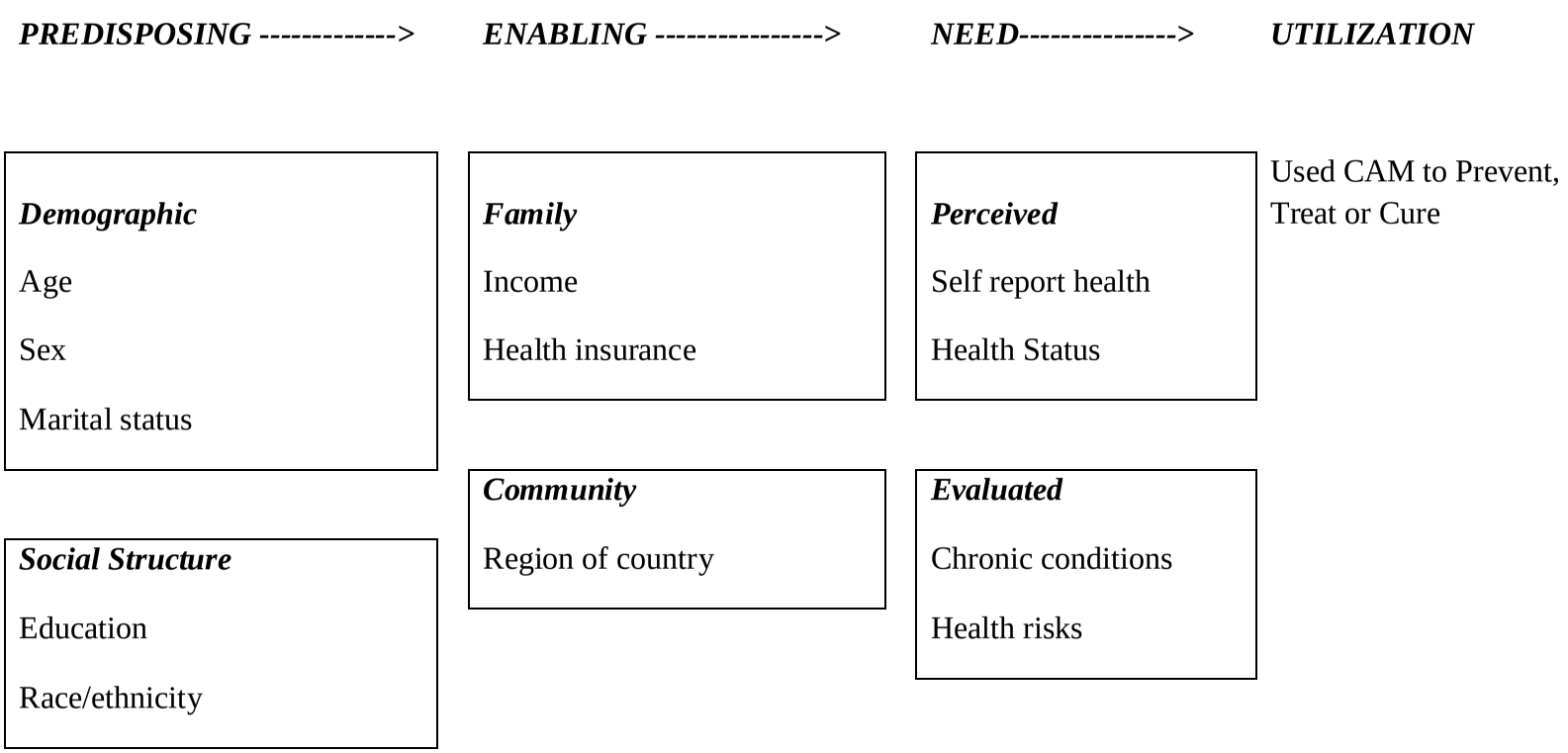


Figure 3.2: Graphical representation of Conceptual Model: from Andersen & Newman (Andersen, 1973)

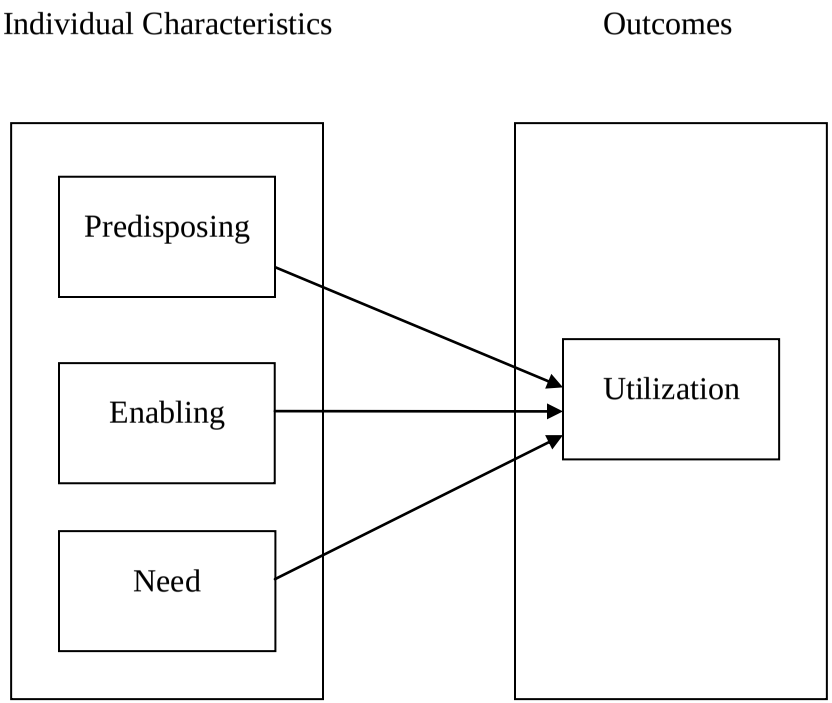


Table 3.1: NHIS Measures Used to Identify the Presence of Chronic Conditions[a]

Condition	*NHIS Questions / Variables Used to Identify the Presence of the Condition*
Cancer	1. cancer causes difficulty with activity; 2. ever told by a doctor you had cancer; 3. cancer causes limitation?
Circulatory	1. ever been told you had a heart attack; 2. ever been told you had a heart condition/disease; 3. ever been told you had coronary heart disease; 4. had a heart attack, past 12 months; 5. had coronary heart disease, past 12 months; 6. had other heart condition, past 12 months; 7. heart problem causes difficulty with activity; 8. heart problem causes limitation; 9. ever been told you have hypertension; 10. had hypertension, past 12 months; 11. hypertension causes difficulty with activity; 12. hypertension causes limitation; 13. lung/breathing problem causes difficulty with activity; 14. lung/breathing problem causes limitation.
Depression	1. depression/anxiety/emotional problem causes difficulty with activity; 2. depression/anxiety/emotional problem causes limitation.
Endocrine, Nutrition, Metabolic	1. endocrine/nutritional/metabolic problem causes difficulty with activity; 2. endocrine/nutritional/metabolic problem causes limitation; 3. ever been told that you have diabetes; 4. diabetes causes difficulty with activity; 5. Diabetes causes limitation.
Memory / Cognition problems	1. Senility/dementia/Alzheimer's causes difficulty with activity 2. Had memory loss in the past 12 months 3. Is activity limited by difficulty remembering? 4. Senility causes limitation

Table 3.1 (continued)

	5. Ever been told you had dementia?
Musculoskeletal	1. musculoskeletal/connective tissue problem causes difficulty with activity; 2. arthritis/rheumatism causes difficulty with activity; 3. back/neck problem causes difficulty with activity; 4. fracture/bone/joint injury causes difficulty with activity; 5. ever been told you had arthritis; 6. ever told you had other joint condition; 7. musculoskeletal/connective tissue problem causes limitation; 8. arthritis/rheumatism causes limitation; 9. back/neck problem causes limitation; 10. fracture/bone/joint injury causes limitation.
Nervous, Sensory	1. nervous system/sensory organ condition causes difficulty with activity; 2. nervous system/sensory organ condition causes limitation; 3. vision problem causes difficulty with activity; 4. vision problem causes limitation; 5. hearing problem causes limitation; 6. hearing problem causes difficulty with activity; 7. ever been told you had a stroke; 8. had stroke, past 12 months; 9. stroke causes difficulty with activity; 10. stroke causes limitation.
Weight problems	1. weight problem causes limitation; 2. weight problem causes difficulty with activity.

[a]Data source: 2007 National Health Interview Survey.

Table 3.2 Characteristics of Women and Men Ages 50 Older, Total Population, and Those Who Used Prayer For Health 2007[a]

	Age 50 and Older				Age 50 and Older Who Used Prayer for Health in the Past 12 Months			
	n	N	%	CI	n	N	%	CI
	n=10,096	n=89,563,649			n=5,756	n=49,394,177		
Gender								
Women	5,734	48,200,788	53.8	52.7, 55.0	3,715	30,204,699	61.15	61.2, 59.7
Men	4,362	41,362,861	46.2	45.0, 47.3	2,050	19,189,478	38.85	38.8, 37.4
Race/Ethnicity	10,096	89,563,649			5,765	49,394,177		
Asian	398	3,321,341	3.7	3.2, 4.2	181	1,430,014	2.90	2.9, 2.4
African Americans	1,467	8,757,149	9.8	9.0, 10.5	1,125	6,570,912	13.30	13.3, 12.2
Hispanic	1,135	7,236,161	8.1	7.3, 8.9	755	4,824,750	9.77	9.8, 8.6
White	7,011	69,478,798	77.6	76.4, 78.8	3,639	36,056,557	73.00	73.0, 71.4
Other	85	770,200	0.9	0.5, 1.2	65	511,944	1.04	1.0, 0.6
Income to Poverty Ratio								
less than 1	1,260	7,888,423	8.8	8.1, 9.5	883	5,442,380	11.02	11.0, 10.0
1 to less than 2	2,070	16,016,480	17.9	17.0, 18.8	1,312	10,049,467	20.35	20.3, 19.1
2 to less than 3	1,787	15,711,006	17.5	16.7, 18.4	1,081	9,407,662	19.05	19.0, 17.8
3 to less than 4	1,222	11,036,082	12.3	11.6, 13.1	656	5,663,539	11.47	11.5, 10.6
4 to less than 5	1,026	9,876,872	11.0	10.3, 11.8	555	5,179,374	10.49	10.5, 9.5
5 and over	2,731	29,034,786	32.4	31.1, 33.8	1,278	13,651,755	27.64	27.6, 25.9
age range								
50 to 54	2,109	20,840,800	23.3	22.2, 24.4	1,111	10,599,199	21.46	21.5, 20.0
55 to 59	1,790	17,134,518	19.1	18.1, 20.2	979	9,108,716	18.44	18.4, 17.1
60 to 64	1,617	15,458,379	17.3	16.3, 18.2	879	8,227,474	16.66	16.7, 15.5
65 to 69	1,369	11,074,402	12.4	11.6, 13.1	783	6,112,401	12.37	12.4, 11.3
70 to 75	1,047	8,172,237	9.1	8.5, 9.8	629	4,756,439	9.63	9.6, 8.7
75 to 79	903	7,361,399	8.2	7.6, 8.8	575	4,629,898	9.37	9.4, 8.5

Table 3.2 (continued)

80 to 84	718	5,508,044	6.1	5.6, 6.7	467	3,404,020	6.89	6.9, 6.1
85+	543	4,013,870	4.5	4.0, 4.9	342	2,556,030	5.17	5.2, 4.5
Insurance Status								
Uninsured	901	7,902,161	8.8	8.2, 9.5	505	4,196,160	8.50	8.5, 7.6
Dual eligible	464	2,866,496	3.2	2.8, 3.6	337	2,011,275	4.07	4.1, 3.5
Medicaid only	306	1,948,227	2.2	1.8, 2.5	222	1,376,419	2.79	2.8, 2.3
Medicare only	1,473	10,978,064	12.3	11.5, 13.0	923	6,910,075	13.99	14.0, 12.9
Medicare Plus	2,417	20,706,312	23.1	22.0, 24.2	1,472	12,261,994	24.82	24.8, 23.3
Other Public Health Insurance	353	3,158,977	3.5	3.1, 4.0	217	1,913,852	3.87	3.9, 3.2
Private Insurance	4,182	42,003,412	46.9	45.5, 48.3	2,089	20,724,402	41.96	42.0, 40.1
Marital Status								
Never married	807	5,308,184	5.9	5.4, 6.5	406	2,448,081	4.96	5.0, 4.4
Married	4,904	56,672,674	63.3	62.1, 64.4	2,630	30,059,041	60.86	60.9, 59.3
Separated, Divorced, Widowed	4,324	27,213,161	30.4	29.3, 31.4	2,707	16,744,038	33.90	33.9, 32.4
Marital Status Unknown	61	369,630	0.4	0.3, 0.5	22	143,017	0.29	0.3, 0.1
Education Levels								
≤ 8	975	6,969,924	7.8	7.1, 8.4	692	4,763,740	9.64	9.6, 8.7
8 – 12	1,078	8,585,841	9.6	8.9, 10.3	713	5,319,820	10.77	10.8, 9.8
High school Diploma	4,689	42,139,526	47.0	45.8, 48.3	2,701	23,864,688	48.31	48.3, 46.7
Associate’s Degree	841	7,701,365	8.6	8.0, 9.2	454	4,031,104	8.16	8.2, 7.3
Bachelor’s Degree	1,454	13,928,284	15.6	14.6, 16.5	714	6,644,065	13.45	13.5, 12.3
Master’s, PhD, MD	948	9,347,681	10.4	9.6, 11.3	444	4,405,591	8.92	8.9, 7.9
Education missing	111	891,028	1.0	0.8, 1.2	47	365,169	0.74	0.7, 0.5

Table 3.2 (continued)

Health Risks								
Smoking	1,526	13,134,047	14.7	13.7, 15.6	798	6,503,750	13.17	13.2, 11.9
Underweight	165	1,389,689	1.6	1.2, 1.9	101	750,962	1.52	1.5, 1.2
Normal weight	3,120	27,310,502	30.5	29.5, 31.5	1,736	14,854,084	30.07	30.1, 28.7
Overweight	3,630	32,875,431	36.7	35.5, 38.0	2,025	17,683,730	35.80	35.8, 34.2
Obese	2,614	23,089,967	25.8	24.7, 26.9	1,679	14,257,132	28.86	28.9, 27.4
BMI Missing	567	4,898,060	5.5	4.9, 6.0	224	1,848,269	3.74	3.7, 3.1
Health Status								
Health better	1,536	13,773,136	15.4	14.5, 16.2	980	8,524,327	17.26	17.3, 16.1
Health the same	7,308	65,294,290	72.9	71.8, 74.0	3,962	34,007,818	68.85	68.8, 67.4
Health worse	1,156	9,770,225	10.9	10.2, 11.6	813	6,795,055	13.76	13.8, 12.6
Health missed	96	725,998	0.8	0.6, 1.0	10	66,977	0.14	0.1, 0.0
Excellent/very good/good health	7,755	70,113,574	78.3	77.3, 79.3	4,128	36,137,961	73.16	73.2, 71.7
Fair/poor health	2,341	19,450,075	21.7	20.7, 22.7	1,637	13,256,216	26.84	26.8, 25.4
Chronic conditions								
Musculoskeletal	5,060	44,024,954	49.2	48.0, 50.3	3,302	27,823,351	56.33	56.3, 54.8
Endocrine, Nutrition, Metabolic	1,695	13,916,535	15.5	14.7, 16.4	1,141	8,914,143	18.05	18.0, 16.8
Circulatory	5,750	49,346,483	55.1	53.9, 56.3	3,620	30,209,328	61.16	61.2, 59.6
Depression	401	3,132,013	3.5	3.1, 3.9	310	2,381,306	4.82	4.8, 4.1
Weight problems	265	2,290,674	2.6	2.2, 2.9	182	1,508,679	3.05	3.1, 2.6
Cancer	1,462	13,005,807	14.5	13.7, 15.4	949	8,194,169	16.59	16.6, 15.4
Nervous, Sensory	1,180	10,063,536	11.2	10.4, 12.0	830	6,864,003	13.90	13.9, 12.8
Memory / Cognition problems	1,121	9,041,793	10.1	9.4, 10.8	782	6,268,801	12.69	12.7, 11.7

Table 3.2 (continued)

Region								
Northeast	1,774	15,932,559	17.8	16.6, 19.0	897	7,524,482	15.23	15.2, 13.9
Midwest	2,338	22,084,078	24.7	23.0, 26.3	1,334	12,391,735	25.09	25.1, 22.9
South	3,696	31,988,486	35.7	33.9, 37.5	2,354	19,898,726	40.29	40.3, 38.1
West	2,288	19,558,526	21.8	20.5, 23.2	1,180	9,579,234	19.39	19.4, 17.9

[a]Weighted descriptive, nationally representative results, Data source: 2007 National Health Interview Survey

Table 3.3: Unadjusted Odds Ratios for Separate Analyses for Gender, Race/ethnicity, and Income, Examining the Relative Likelihood of Using Prayer for Health in the Past 12 Months, 2007[a]

Effect	OR	LB	UB	p-value
Gender				
Men	1			
Women	1.94	1.77	2.13	***
Race/ethnicity				
White	1			
Hispanic	1.86	1.54	2.23	***
Asian	0.70	0.56	0.88	**
African American	2.79	2.39	3.25	***
Other	1.84	0.96	3.53	+
Income to need ratio				
≤ 1	2.11	1.77	2.52	***
1 to < 2	1.60	1.37	1.87	***
2 to < 3	1.42	1.21	1.66	***
3 to < 4	1			
4 to < 5	1.05	0.88	1.25	
5 +	0.84	0.73	0.97	*

[a]Data source: 2007 National Health Interview Survey. OR=Odds Ratio; UB, LB=Upper and lower bounds of the 95% confidence interval. Reference categories: men, White, and income-to-need ratio 3 to < 4. The table presents separate unadjusted analyses for gender, race/ethnicity, and income-to-need-ratio.

Table 3.4: Multivariate Logistic Analysis Predicting the Likelihood of Using Prayer for Health During the Past 12 Months, Women and Men Ages 50 and Older, 2007[a]

Effect	***OR***	***LB***	***UB***	***p-value***
Exposure Variables				
Gender				
Women	1.97	1.78	2.19	<.0001
Men	1			
Race/Ethnicity				
White	1			
Hispanic	1.97	1.59	2.44	<.0001
Asian	0.90	0.69	1.18	0.4556
African American	2.55	2.16	3.03	<.0001
Other	1.80	0.92	3.50	0.0848
Income to need ratio				
≤ 1	1.47	1.19	1.81	0.0003
1 to < 2	1.26	1.06	1.50	0.0079
2 to < 3	1.30	1.10	1.54	0.0022
3 to < 4	1			
4 to < 5	1.05	0.87	1.26	0.649
5 +	0.99	0.84	1.16	0.8812
Predisposing / Demographic				
Age Ranges				
ages 50 to 54	1			
ages 55 to 59	1.03	0.88	1.21	0.6862
ages 60 to 64	0.95	0.79	1.14	0.5823
ages 65 to 69	0.86	0.68	1.09	0.2101
ages 70 to 74	0.86	0.68	1.10	0.2209
ages 75 to 79	0.98	0.75	1.28	0.8847
ages 80 to 84	0.89	0.67	1.18	0.4276
85 and older	1.02	0.72	1.42	0.9325
Marital status				
Married	1			
Never Married	0.66	0.54	0.81	<.0001
Separated, Divorced, Widowed	0.99	0.87	1.12	0.8148
Marital Status Unknown	0.81	0.38	1.71	0.5825

Table 3.4 (continued)

Predisposing / Social Structure				
Education Levels				
≤ 8	1.15	0.92	1.43	0.2122
8 – 12	0.94	0.79	1.12	0.4787
High School Diploma	1			
Associate's Degree	0.87	0.72	1.05	0.1474
Bachelor's Degree	0.90	0.77	1.04	0.1639
Master's, PhD, MD	0.91	0.76	1.09	0.294
Education missing	0.50	0.32	0.77	0.0019
Enabling / Family				
Insurance Coverage				
Private Health Insurance	1			
Dual eligible	1.13	0.80	1.59	0.4864
Medicaid only	1.31	0.85	2.03	0.2186
Medicare only	1.19	0.97	1.47	0.0987
Medicare Plus	1.13	0.92	1.39	0.2482
Other public health insurance	1.19	0.89	1.60	0.2407
Uninsured	0.90	0.73	1.11	0.3277
Enabling / Community				
Region				
South	1			
Northeast	0.57	0.49	0.68	<.0001
Midwest	0.86	0.73	1.03	0.0975
West	0.60	0.52	0.70	<.0001
Need / Perceived				
Health Status				
Health same	1			
Health better	1.41	1.23	1.62	<.0001
Health worse	1.42	1.17	1.73	0.0005
Health status missing	0.10	0.04	0.24	<.0001
Self reported health				
Excellent/very good/good health	1			
Fair/Poor	1.13	0.98	1.32	0.1041
Need / Evaluated				
Health Risks				
Smoking	0.67	0.57	0.79	<.0001
Normal weight	1			

Table 3.4 (continued)

Underweight	0.75	0.51	1.10	0.1421
Overweight	1.02	0.89	1.16	0.7722
Obese	1.06	0.92	1.22	0.4118
BMI Missing	0.46	0.36	0.60	<.0001
Chronic conditions				
Musculoskeletal	1.43	1.29	1.60	<.0001
Endocrine, Nutrition, Metabolic	1.01	0.86	1.19	0.9072
Circulatory	1.32	1.19	1.47	<.0001
Depression	1.83	1.30	2.58	0.0005
Weight problems	1.08	0.74	1.56	0.7004
Cancer	1.36	1.18	1.56	<.0001
Nervous, Sensory	1.17	0.97	1.41	0.0953
Memory / Cognition problems	1.13	0.93	1.38	0.2322

[a]Data source: 2007 National Health Interview Survey. UB, LB=Upper and lower bounds of the 95% confidence interval. Reference categories: men, White, ages 50-54, married, high school graduate, income-to-need ratio 3 to <4, private health insurance, normal weight, health status unchanged in past 12 months, excellent/very good/good self-reported health, South. Public health insurance = not covered by Medicare, Medicaid, private health insurance, and not uninsured.

CHAPTER 4: BARRIERS TO TRADITIONAL HEALTH CARE AND RECOMMENDATIONS OF OTHERS TO MOTIVATE USE OF COMPLEMENTARY AND ALTERNATIVE MEDICINE

Introduction

People ages 50 and older are the largest consumers of medical services, including provider services, hospital services, and pharmaceuticals (Administration on Aging, 2010; Barnes, Powell-Griner, & McFannk, 2004; Mueller, et al., 2008). A substantial number of people may substitute complementary and alternative medicine (CAM) for medical services (Cuellar & Aycock, 2003). Identifying reasons for CAM use in the United States' highly "medicalized" population could help schools that train physicians, nurses, and other health care providers develop curricula that better address the needs of older Americans. A better understanding of reasons for CAM use by older adults can help health care providers: discuss how CAM may help when conventional medicine is ineffective (Fink, 2002), caution against CAM use for patients whose conventional medicine may have a negative interaction with CAM (Rhee, 2004), or recommend CAM as a cost effective alternative to conventional medicine (Fink, 2002).

The National Center for Complementary and Alternative Medicine (NCCAM), a unit of the National Institutes of Health, defines CAM as a group of health care systems and medical care practices and products not generally considered as conventional medicine. CAM includes complementary, alternative, and integrative medicine. Complementary medicine is used in conjunction with conventional medicine; alternative medicine is used instead of conventional medicine; integrative medicine combines

traditional medicine and CAM (Barnes, et al., 2008). NCCAM has suggested organizing CAM into four categories: (1) energy medicine, (2) manipulative and body-based practices, (3) biologically based practices, and (4) mind-body medicine. Eisenberg et al (Eisenberg, 1993) defines CAM as "medical interventions not taught widely at US medical schools or generally available at US hospitals." Many therapies considered to be CAM in the US have been used commonly for centuries in other cultures, such as American Indian, African, Indian, and Hispanic cultures (Fennell, et al., 2009).

Use of CAM has increased substantially in the U.S. over the past few decades (Eisenberg & Davis, 1998). Eisenberg and colleagues found an almost 10% increase in CAM use between 1990 and 1997 (Eisenberg & Davis, 1998). In a study using data from the 2007 National Health Interview Survey (NHIS), researchers found that 38.3% of American adults used CAM, up from 36% reporting use in 2002 (NCCAM, 2008). Societal trends toward increasing participation in medical decision making since the late 1960s and early 1970s, and the increased availability of medical information on the Internet, have contributed to this trend (McCaffrey, et al., 2007). It would be useful for health care policy makers to better understand how changes in CAM use are affecting health care delivery. Given the rise in CAM use, it is useful for policy makers to better understand CAM use as a market-driven service provision (McCaffrey, et al., 2007). Few studies have examined reasons that Americans age 50 and older give for using CAM.

The new Health Care Bill, H.R. 3590 generated several new programs, including programs to close the gap between "test tube" and "treatment table" (Reddy, 2010). The

provisions of this Bill call for the President to establish an advisory group that will include integrative health practitioners with patient-centered outcomes as the bottom line of patient care focus (Reddy, 2010). The definition of "integrated health care provider" is still under debate; physicians argue that they alone should hold this title (Reddy, 2010). One of the goals of the Integrated Health Care Policy Consortium (IHPC), a broad coalition of clinicians, is to ensure access to a range of both CAM and conventional medicine (Integrated Healthcare Policy Consortium, 2010). Under this new legislation, licensed CAM providers will be able to get paid for their services through private and public insurance plans (Reddy, 2010). Section 352 of this Bill supports government grants to establish community health teams, which can include licensed CAM practitioners, and to coordinate appropriate use of CAM services with conventional care (Patient Protection and Affordable Care Act, 2010).

Study Objectives

The purpose of this study is to examine four specific reasons older Americans are using CAM. These reasons include two barriers that keep older Americans from using the conventional medical system: CAM is sometimes used because conventional medicine did not help, or because it was too expensive. The four reasons also include two common recommendations that encourage older Americans to use CAM: recommendations from a health care provider, or from friends, family, or co-workers. This study examines the prevalence of CAM use attributed to these barriers and recommendations, focusing on variation associated with race/ethnicity, gender, and income.

Literature Review

Overview of CAM

CAM includes many products, therapies and practices used to promote wellness and to treat illness (WHCCAMP, 2002). CAM categories have diverse elements, some of which can be found in conventional medicine and some of which cannot (WHCCAMP, 2002). CAM and conventional medicine have common elements, such as an emphasis on whole systems, self-care, self-healing, and the integration of mind-body as part of the healing or prevention process (WHCCAMP, 2002). Other CAM treatments found in conventional medicine include elements such as preventative practices and good nutrition (WHCCAMP, 2002). CAM providers tend to focus on the individual, which includes treating the individual as a whole person, including a spiritual element, and promoting self-care (WHCCAMP, 2002). Compared with conventional medicine, CAM often lacks scientific proof of efficacy (WHCCAMP, 2002).

The National Center for CAM (NCCAM) is part of the National Institutes of Health (NIH). It is the Federal Government's lead agency for scientific research on CAM (NCCAM, 2009a). Its purpose is to explore CAM in the context of rigorous science with the intent to share the findings with professionals and the public (NCCAM, 2009a). To focus efforts and use research funds efficiently, it is in the public interest to understand the characteristics of older individuals who are using CAM, and their reasons for CAM use.

As in the general population, CAM use is increasing among older adults (Astin, et al., 2000; Cherniack, et al., 2001; Eisenberg & Davis, 1998; Flaherty, et al., 2001). CAM

use among older adults can be attributed in part to their multiple health problems including general poor health and chronic disease (Cherniack, et al., 2001). Among older people, there is evidence that CAM is used most frequently for age-related chronic conditions such as cancer, depression, pain and arthritis (Williamson, et al., 2003).

Prevalence of CAM Use

CAM use has increased from 33.8% in 1990 to 42.1% in 1997 (Eisenberg & Davis, 1998), although the percentage increase identified depends on the population studied and the specific CAM included in the analysis. Nearly 40% of adults reported using CAM in a recent survey (NCCAM, 2008). In a national survey conducted in 2002, 36% of respondents reported using CAM in the past 12 months; when prayer for health was included that figure rose to 62% (Burke, et al., 2006). Among cancer survivors, CAM use is estimated to be as high as 83% (Mao, et al., 2007). The White House Commission on CAM reported that public use and interest in CAM has increased steadily over the past 30 years. It is estimated that as much as 43% of the U.S. population uses CAM (WHCCAMP, 2002). The 2007 National Health Interview Survey (NHIS) suggested that 38.3% of American adults used CAM, up from the 36.0% in 2002 (NCCAM, 2008). Among patients of internal medicine teaching clinics, 84% reported using CAM, where that measure included prayer, exercise, or diet used with the expectation of improving health (Rhee, 2004).

CAM use among older Americans has increased and is predicted to grow (Astin, et al., 2000; Cherniack, et al., 2001; Cheung, et al., 2007; Eisenberg & Davis, 1998; Flaherty, et al., 2001). Physiological factors are likely to contribute to this increase

(Cherniack, et al., 2001). Poor health, multiple health problems, and chronic disease are often associated with CAM use by older Americans (Cherniack, et al., 2001). As America ages, the increasing number of older Americans is likely to increase the ranks of those who seek to both improve their quality of life and better manage their chronic health problems through CAM (Williamson, et al., 2003).

Societal trends toward increasing participation in medical decision making and increased availability of medical information on the Internet, factors that have influenced health care since the late 1960s and early 1970s, have contributed to increased CAM use (McCaffrey, et al., 2007). Patients who report using CAM indicate that doing so gives them a sense of control over their medical care (S. Wang, et al., 2003).

Disadvantages of CAM Use

Most types of CAM have not undergone rigorous testing (WHCCAMP, 2002). Health care providers may be willing to recommend CAM only if there is strong evidence of safety and efficacy (Cleland, et al., 2006). On the other hand, many conventional medicines work well only for a portion of the population, and most have safety concerns (Chao, 2006; Eddy, 2005). Yet, most conventional medicine is commonly accepted for use. Of course, these arguments do not suggest that CAM should be adopted by conventional medicine in the absence of persuasive information about safety and efficacy.

A number of studies have reported that CAM can interact negatively with conventional medication (Barnes, et al., 2008; Chong, 2008). Poly-pharmacy and drug interactions present potential problems. When people combine prescription medication

with CAM, this can often lead to adverse interactions (Cheung, et al., 2007; Tachjian, 2010). Many older adults take multiple prescription medications to control a number of chronic conditions (Dergal, 2002). Older adults using CAM may be at greater risk for adverse reactions between CAM and prescription medication (Dergal, 2002; Tachjian, 2010). In a cross-sectional study conducted in Brunei Darussalam, 21% of 568 randomly selected visitors to the medical wards reported using CAM in addition to their conventional medication (Chong, 2008). Older people are often unaware of the potential negative interactions of CAM and prescription medications (Chong, 2008; Tachjian, 2010).

Adverse drug-CAM interactions can be severe (Dergal, 2002; Tachjian, 2010). Some herbal products can be fatal when combined with prescription medication (Barnes, et al., 2004). For example, physicians often prescribe aspirin to prevent cardiovascular episodes. Aspirin can react negatively when taken with ginkgo biloba (Dergal, 2002). Hemorrhage as a result of combining aspirin and ginkgo has been reported (Dergal, 2002; Rosenblatt, 1997; Tachjian, 2010).

Health Care Provider Communication

Given the potential negative interactions of herbal medicine and conventional medicine, researchers recommend that patients inform their health care providers of any herbs they are taking, and that health care providers ask patients about CAM use (Rhee, 2004). Patients frequently fail to inform doctors of use of herbs and dietary supplements (Dergal, 2002). Patients do not disclose CAM use because they do not think it is important, or are concerned that their doctor might disapprove (Barraco, 2005). Lack of

awareness about what constitutes CAM is another reason: some CAM users may not know that what they are taking or doing is considered CAM; thus, they do not report CAM use to their health care providers (Chong, 2008). In an age-stratified cross-sectional survey of adults ages 65 and older living in the community (n=1200), 69% reported using CAM; of these, only 53% disclosed CAM use to their primary care providers (Cheung, et al., 2007). Two nationally representative telephone surveys measuring CAM use in 1991 (n=1539) and 1997 (n=2055) found that disclosure rates remained essentially unchanged, with 39.8% of participants telling their medical provider of their CAM use in 1991, compared to 38.5% in 1997 (Eisenberg, et al., 2008). In a study of patients of 23 rheumatologists, 2075 patients received a survey on their CAM use; of the 51% who responded, 17% reported that the medical providers did not ask about their CAM use, and 52% that their medical providers asked about CAM use less than half the time (Sleath, et al., 2008). Patients were more likely to disclose CAM use if the rheumatologists included them in treatment decisions and asked directly about CAM use (Sleath, et al., 2008). Using data from the 2002 NHIS, researchers found that 60% of patients did not discuss their CAM use with health care providers because the health care provider did not ask about CAM use (Eisenberg, et al., 2008).

Health care providers often fail to ask about CAM due to time constraints, or because they did not think to ask (Fennell, et al., 2009). The lack of health care provider inquiry about CAM use is underscored in two other studies. In one, 17% of physicians never asked about CAM use (Sleath, et al., 2008). In another, 52% of physicians asked patients about CAM use less than half the time (Corbin, 2002). One researcher suggests

that it is the ethical obligation of health care providers to ask about CAM use, not only to avoid possible herb-drug interactions but also to facilitate open patient-provider communication (Dent, 2006). To promote open discussion about CAM with patients, health care providers need to show an open attitude (Patterson, et al., 2002).

People in ethnic minorities are also unlikely to disclose CAM use to health care providers unless directly asked (Dent, 2006; Grahm, 2005). Discussion about CAM use with primary care health care providers is particularly infrequent among Hispanics and African Americans (Fennell, et al., 2009). The lack of disclosure, sometimes complicated by a language barrier, underscores the need for health care providers to be proactive with patients about CAM use.

The importance of health care providers being knowledgeable about both conventional medicine and CAM was reported by the Medical School Objectives Project in 1998 (Wetzel, et al., 1998). Results from a national study of medical schools, with 51% of US medical schools participating, suggest that more than 60% of medical students support including more study of CAM in their training (Abbott, et al., 2010). Health care providers need more CAM training so they can counsel patients about evaluating the potential risks and efficacy of CAM, and also so they can coordinate conventional medicine with CAM (Abbott, et al., 2010). Although medical schools increasingly offer training in CAM, the level of quality and access varies substantially (Abbott, et al., 2010). Many medical students do not view CAM therapies as being evidence based (Abbott, et al., 2010; Chaterji, et al., 2007). This is particularly true of first year medical students (Chaterji, et al., 2007).

Chronic Conditions and CAM Use

Chronic illness is the nation's greatest health care problem (CDC, 2009a). In the year 2000, the US population was 276 million; nearly 125 million had some type of chronic condition (Hall, 2003). In 2005, almost 1 out of every 2 adults (133 million) had at least one chronic condition (CDC, 2009a). Chronic diseases, such as arthritis, stroke, cancer, heart disease, and diabetes are among the most costly, common, and preventable health problems in the U.S. (CDC, 2009b; Saydah & Eberhardt, 2006). Among older people, CAM is used most frequently for age-related chronic conditions such as cancer, depression, pain and arthritis (Williamson, et al., 2003). Medication and treatment for these chronic conditions can be costly and/or ineffective (Rosenberg, 2008; Saydah & Eberhardt, 2006). Thus, many older Americans turn to CAM for symptom relief (Rosenberg, 2008).

Use of CAM When Conventional Medicine Is Viewed as Being Ineffective

Americans are increasingly using CAM because they are dissatisfied with conventional medicine (McCaffrey, et al., 2007). People frequently turn to CAM when conventional medicine is inadequate to treat pain or chronic diseases (Astin, 1998). In one study using data from the 2002 National Health Interview Survey (NHIS), researchers found that one-third of all the survey participants used CAM because conventional medicine did not help (Grahm, 2005). In another study, 12% of people with multiple sclerosis (n=1573) indicated that they used CAM because conventional medicine did not help (Schwarz, et al., 2008). Arthritis and many other forms of chronic pain are common among older adults, and frequently resistant to conventional pain medication

(Barnes, et al., 2004; Cherniack, et al., 2001). More than one third of survey respondents in a national telephone survey of women aged 18 years and older, conducted in four languages (n=3172), indicated their reason for using CAM was side effects or ineffectiveness of conventional medicine (Chao, 2006). Chao found that negative side effects or ineffectiveness of conventional medicine were two reasons that turned users to CAM (Chao, 2006). One-quarter of the women in Chao's study used CAM because conventional medicine did not work (Chao, 2006). In an age-stratified cross-sectional survey of adults ages 65 and older who lived in the community (n=1200), 29% indicated that they used CAM because conventional medication did not control pain; 6% that conventional medicines had too many adverse side-effects; and 2% that conventional medical system was not helpful (Cheung, et al., 2007).

Conventional Medicine was Too Expensive

The White House Commission reported that underserved populations often use CAM because they cannot afford conventional medicine (WHCCAMP, 2002). People often use CAM as a substitute for conventional medicine, or in conjunction with it, because they want to avoid the high cost of medication (Cuellar & Aycock, 2003). In a national telephone survey of 3172 women inquiring of their CAM use, 14% reported they used CAM because conventional medicine was too expensive (Chao, 2006). Grahm analyzed data from the NHIS 2002 Alternative Health component and found that Hispanics were particularly likely to say that they used CAM because conventional medical treatments were too expensive (Grahm, 2005).

CAM is increasingly used when conventional medical solutions are perceived as

too expensive (Fox, 1997; McCaffrey, et al., 2007). In a series of 16 studies of people with HIV/AIDS, researchers found that those who substituted CAM for conventional medicine generally did so because conventional medicine was viewed as too expensive (Wootton, 2001).

Recommended by Health Care Providers

To balance the risks and benefits for patients with persistent or chronic problems, health care providers may often try a number of treatments to find the optimal solution for each patient (Chao, 2006). In a national telephone survey of 3,172 women, one third of White, Hispanic, and African American women reported recommendations from health care providers as a reason for using CAM (Chao, 2006). In a study of patients with multiple sclerosis (n=1,573), researchers found that 16% of participants indicated that they used CAM because it was recommended by health care providers (Schwarz, et al., 2008). In a cross-sectional analysis of the American Cancer Society's longitudinal Study of Cancer Survivors-I, 69.3% of cancer survivors reported using dietary supplements after their cancer diagnosis; 47.3% said that they had received their information on dietary supplements from their doctors (Ferrucci, 2009).

Recommended by Family, Friends, or Co-Workers

Consumers often make decisions about medical treatment based on information from family and friends (Carman, et al., 2010). In a national telephone survey of 3,172 women aged 18 years and older, Choa found that Mexican American women were the most likely to use CAM because of family influence (Chao, 2006). In a survey of 1,573 adults with multiple sclerosis, 26% reported using a CAM because it was recommended

by family or friends (Schwarz, et al., 2008). In Ferrucci's cross-sectional study of the American Cancer Society's 827 cancer survivors, 69.3% of which reported using dietary supplements after their cancer diagnosis, 37.5% used the dietary supplements at the recommendation of family or friends (Ferrucci, 2009).

Research Objectives and Hypotheses

The objective of this study is to examine barriers to conventional medicine, and recommendations for CAM use, that affect older adults' use of CAM. The analysis focuses on variation in CAM use associated with race/ethnicity, gender, and income. The findings will contribute new knowledge regarding older Americans' CAM use. Using a nationally representative survey of Americans conducted in 2007, and focusing on women and men age 50 and over, the three hypotheses and one research question are:

Hypotheses

1. CAM Use Will Differ by Race/Ethnicity.

As late as 2009, in a survey addressing the relationship between education and conspiracy beliefs surrounding HIV among 205 HIV-positive African American patients, a majority said that the government is withholding information about AIDS as well as a cure for AIDS (Zekeri, Habtemariam, Tameru, Ngawa, & Robnett, 2009). That finding illustrates the fact that African Americans have a historic distrust of traditional medicine. That distrust may be due in part to the Tuskegee syphilis study (Corbie-Smith, Thomas, Williams, & Moody-Ayers, 1999; Gamble, 1997; Wallace, et al., 2007; Zekeri & Habtemariam, 2006). Further complicating distrust of conventional medicine among African Americans is the small number of African American physicians (Zekeri &

Habtemariam, 2006). As a result of these factors, a reasonable hypothesis is that African Americans will be less likely than Whites to attribute CAM use to having received a provider recommendation to use it.

2. Women Will Be More Likely than Men to Use CAM.

Women are more likely than men to follow provider recommendations (Stewart, 1997). Women are also more likely to have chronic conditions, and live longer with them (Arora, 2008; S. B. Laditka & Laditka, 2009). Those who use CAM often do so with the expectation that CAM can help with chronic conditions where conventional medicine fails, or is perceived to fail, or entails unwanted risks or side effects (Rhee, 2004; Rohrer, Merry, Adamson, & Barnes, 2008; Stewart, 1997). Also, women have less money than men, and are more likely to substitute CAM for conventional medicine to control health care spending.

3. CAM will be used less by those with higher incomes than by those with lower incomes.

Those who can afford medical care and pharmaceuticals will have less need to substitute CAM for medication and medical care, and therefore will be less likely than those with lower incomes to use CAM.

Research Question:

The literature on use of CAM because it was recommended by family, friends, or co-workers is sparse, and there is little theory that would meaningfully support hypotheses. In addition to the three hypotheses, a research question regarding use of CAM because it was recommended by family, friends, or co-workers: What are the

characteristics of older people who use CAM because it was recommended by family, friends, or co-workers?

Design and Methods

Conceptual Framework

The conceptual model used is based on the Andersen behavioral model of health service use (Andersen, 1973). Our application of the model for understanding use of CAM has been described previously (Tait, 2010). The Andersen model is well known, widely used, and has recently been extended to use of CAM (Brown, 2009; Goldsmith, 2002). The model hypothesizes that use of health services is a function of three sets of factors: 1) societal factors, 2) health services system factors, and 3) individual factors (Bradley, et al., 2002; Goldsmith, 2002; J. N. Laditka, 2003). This model is based on characteristics that predispose users to choose certain services, enable them to use those services, and establish a need to use those services (J. N. Laditka, 2003). The model is shown in Figures 1 and 2.

Individual factors in this model are categorized as need factors, enabling factors, and predisposing factors (Bradley, et al., 2002; J. N. Laditka, 2003). Predisposing factors include both demographic and social structure indicators. Enabling factors encompass community and family indicators. Need factors include perceived and evaluated need (Bradley, et al., 2002).

Dependent Variables

There are four dependent variables, each used in a separate analysis:

Used CAM because medical treatments did not help;

Used CAM because medical treatments were too expensive;

Used CAM because it was recommended by a health care provider;

Used CAM because it was recommended by family, friends, or co-workers.

Each dependent variable is coded using results of between 19 to 23 survey questions, depending on the dependent variable (Exhibit 1). Each question focused on the last 12 months, with the exception of questions about use of vitamins and herbs, for which the questions asked "did you [use the given CAM]," rather than "in the past 12 months, did you [use the given CAM]." Each variable is coded 0=no, 1=yes.

Covariates

Details of the variable coding have been described previously (Tait, 2010). All variables are represented dichotomously. Categorical variables are expressed in the model using a dummy variable to indicate each category. Referent groups are chosen to serve as the most useful point of comparison (Hardy, 1993). The general guideline used for selecting the referent category is to choose the category with greatest number of observations. This decision rule was used for the following variables: race/ethnicity, insurance, age, marital status, education, income, weight, health status, self-reported health, and region. For the income-to-need ratio, the mid-point was judged to provide the best point of comparison. Thus, individuals with higher or lower incomes are compared to those with incomes in the middle of the income-to-need distribution.

Predisposing indicators are generally separated into two groups: demographic characteristics and social structure.

Predisposing / demographic indicators include age, sex, and marital status (Bradley, et al., 2002; J. N. Laditka, 2003). For sex, men are the referent group. Age has been re-coded into 5-year age ranges, consistent with other studies that analyze differences in CAM use by age cohorts. This categorization limits the possibility of residual confounding while permitting the identification of any notable non-linearities in the results. The referent category for age is 50 to 55. Marital status was divided into four categories: never married; married; separated, divorced, or widowed; and marital status unknown. The referent category for marital status is married.

Predisposing / social structure indicators include education and race/ethnicity. Education is divided into seven groups based on education completed: grade 8 or less; grades 9 to 12; high school diploma; associate degree; bachelor's degree; MS, MD, or PhD; and education missing. The referent category is completion of high school. Race/ethnicity is characterized by five groups: Hispanic, Asian, non-Hispanic African American (hereafter referred to as African American), other, and non-Hispanic White (hereafter referred to as White). White is the referent category. The few individuals who reported both Asian and Hispanic ethnicity were categorized as Hispanic.

Enabling factors encompass such elements as community and family. Community is represented in these data by region of the country. Family indicators include income level and health insurance (Andersen, 1973; Bradley, et al., 2002; J. N. Laditka, 2003).

Enabling / Family. The family indicator of income level is the income-to-need ratio. An income-to-need ratio variable is included in the logistic regression models to

control for differences in family income. Following a standard definition used in economic analyses, the income-to-need ratio is calculated using family size, total household income, and household makeup (such as the number of children and older adults, where both groups are presumed to consume fewer resources than adults of working age), and adjusted for annual cost of living using federal poverty guidelines (U. S. Census Bureau, 2009). Individuals with an income-to-need ratio of 1 have exactly the income that defines the federal poverty threshold for someone in similar family circumstances. Those with an income-to-need ratio of 2 have twice that level of income. The income-to-need ratio is divided into five groups: < 1, 1 to <2, 2 to <3, 3 to <4, 4 to <5, and 5+, with <1 being the poorest and 5+ being the wealthiest. The referent category for income-to-need is 3 to <4.

Health insurance is grouped into seven categories: dual eligibility, for individuals enrolled in Medicaid and Medicare; Medicaid only; Medicare only; Medicare Plus, which identifies Medicare beneficiaries who also have supplemental medical insurance; other public health insurance; private health insurance; and uninsured. Private health insurance is the referent category. The presence or absence of health insurance and the quality/type of health insurance is associated with health status, an effect that crosses all sociodemographic borders (Franks, et al., 1993).

Enabling / Community Characteristics. The only community factor with a measured variable in this study is region of the country (Wennberg, et al., 2002). Region has been found to be a contributing factor in Medicare costs and service use (Wennberg,

et al., 2002). Identified regions are: Northeast, Midwest, West, and South. The South is the referent category.

Need is comprised of an individual's health and functional capacity, both as perceived by the individual and as evaluated by medical practitioners (Bradley, et al., 2002; J. N. Laditka, 2003). One measure of perceived need in the present study is the individual's perception and self-report of her or his health status at the time of the survey, compared with her or his recollected health status a year before the survey. Another measure of perceived need is from self-reports of current health status. Evaluated need requires professional judgment and objective measurements; the NHIS provides proxy measures of evaluated health need, which result from asking participants if a doctor or other health professional has told them that they have diabetes, hypertension, or a variety of other medical conditions (Bradley, et al., 2002).

Need / Perceived Good Health is represented by self reported health status. Self reported health is an indication of how the person feels about her or his health currently. This variable has two categories: 1) excellent, very good health, or good health, and 2) fair or poor health. The referent category includes three levels of self reported health: excellent, very good, and good. Health status compares a person's health on the day of interview with her or his overall health one year earlier. It is divided into four sub-categories, comparing current health status to last year's health status: better, same, worse, or missing, with "same" as the referent category.

Need / Evaluated Health factors include both chronic conditions and health risks. Health risks include: current smoker, and weight categories. Weight categories are

divided into four groups using body mass index (BMI) cut points defined by the Centers for Disease Control and Prevention (CDC): underweight, normal weight, overweight, and obese. An additional dummy variable represents the relatively small number of individuals with missing BMI information. Normal weight is the referent category.

Eight chronic conditions were included: musculoskeletal, endocrine and metabolic, circulatory, depression, weight problems, cancer, nervous, and problems with memory or cognition. Each of these conditions was coded based on a set of variables relating to the given condition. For example, an individual was considered to have cancer if she or he reported: cancer caused difficulty with activities; cancer caused any limitation; or a doctor had diagnosed cancer. Table 1 shows a summary of the coding for the eight chronic conditions.

Overview of the National Health Interview Survey (NHIS)

The National Health Interview Survey (NHIS) is a nationally representative survey conducted annually in the U.S. Details about the survey as it applies to this study of CAM have been described (Tait, 2010). This survey collects information about use of medical services, health status, and other health measures reported by survey participants. This survey has been conducted annually in the U.S. since 1963. It is a cross-sectional, multistage household survey (NHIS, 2009).

The NHIS is a principal source of health information about the civilian, non-institutionalized population of the United States. The NHIS is conducted by the National Center for Health Statistics (NCHS). Survey exclusions include those who are incarcerated, patients in long-term care facilities, people on active duty with the Armed

Forces, and any U.S. nationals living abroad. Dependents of individuals in excluded categories may be included in the survey (NHIS, 2009).

NHIS Survey Components

The NHIS questionnaire is made up of core questions, a basic set of questions regarding health, and demographic items. In addition to the core questions, each year there are three components: 1) a Household component, which collects limited demographic information on all individuals living in the household; 2) a Family component, which verifies and collects additional information about the access and utilization of health care, health limitations, injuries, health status, insurance, income and assets; and 3) Sample Adult and Sample Child components. The Sample Adult and Sample Child components are comprised of one participant randomly selected from the Sample Adult Core and Sample Adult Child questionnaires (NHIS, 2009).

Each year, supplemental questionnaires are included in the survey. These supplements may be included one-time only, or asked on a rotating basis. The Complementary and Alternative Health supplement was conducted in 2002 and 2007, with a small pilot questionnaire included in the 1997 survey (NHIS, 2009).

This study uses three components from the 2007 National Health Interview Survey. These components are the Family component, the Sample Adult component, and the Complementary and Alternative Health component (NHIS, 2009). A total of 23,393 adults age 18 and over responded to the CAM supplement; the response rate was 68.7% (Barnes et al., 2008). The Complementary and Alternative Health component contains

over 3,000 variables describing the use, use frequency, and intended purpose for use of 36 individual types of CAM (NHIS, 2009).

Ethical Considerations

The data are de-identified. This study was approved by the IRB at the University of North Carolina at Charlotte. All data are de-identified and freely available to the public at the website of the National Center for Health Statistics (http://www.cdc.gov/NCHS/nhis/nhis_2008_data_release.htm).

Older Americans Defined

Using age 50 and over as an inclusion criterion for this research is consistent with established approaches to defining older populations, especially in the context of health promotion or disease prevention specifically regarding chronic diseases and cognitive problems (CDC, 2007). Age is a risk factor for many chronic diseases, including heart problems, hypertension, dementia and arthritis (National Cancer Institute, 2009). The National Cancer Institute uses age 50 as a cut-point for identifying elevated risk for breast cancer (National Cancer Institute, 2009).

Statistical Analysis

This was a cross-sectional study where exposure and disease status were simultaneously assessed, using data from the 2007 NHIS. Analyses included descriptive, bivariate, and multiple logistic regression. All analyses were weighted for national representation of population characteristics including race/ethnicity, gender, income, education, specific age groupings, and others (NHIS, 2009). Data analysis was conducted using SAS 9.1 (Cary, NC), and accounted for the complex survey design.

Four logistic regression models were estimated, one for each of the four reasons for CAM use, controlling for the exposure and control variables. Variables were assessed for multicollinearity; there was no evidence that multicollinearity was sufficiently great to have affected the results meaningfully.

Results

Table 2 shows the percentage of the sample reporting each of the reasons for CAM use. Of older adults who reported using a CAM: 26.63% reported doing so because the CAM was recommended by a health care provider; 22.51% because it was recommended by family, friends, or co-workers; 5.79% because conventional medicine did not help; and 4.47% because conventional medicine was too expensive. Cross-tabulation results suggest that generally only one of these four reasons is given for CAM use.

Characteristics of the Sample

The weighted descriptive nationally representative results appear in Tables 3 and 4. The sample of those age 50 and older was 10,096 individuals, representing about 89.5 million older people. Table 3 shows information representing all Americans ages 50 and older in the data columns at the left, information representing those ages 50 and older who used CAM because conventional medicine did not work in the data columns in center, and information representing those ages 50 and older who used CAM because conventional medicine was too expensive in the data columns at the right. For all three groups, results are shown for the exposure and control variables. Table 4 shows information representing all Americans ages 50 and older in the data columns at the left,

information representing those ages 50 and older who used CAM because it was recommended by a health care provider in the center data columns, and information representing those ages 50 and older who used CAM because it was recommended by family, friends, or co-workers in the data columns at the right. Tables 3 and 4 show the sample size (n), the weighted population size (N), the weighted percent for each category, and the confidence interval for the percent estimate. Except where noted, all results described below are weighted for national representation. All results refer to those ages 50 and older.

Conventional Medicine Did Not Work

Those aged 50 and older who use CAM because conventional medicine did not work have a sample size of 567 (representing about 5.2 million older people). Women were 53.8% of the total population, but 63.2% of those who used CAM because conventional medicine did not work. These unadjusted results suggest that women were considerably more likely than men to have used CAM because conventional medicine was not effective. Those with musculoskeletal problems were 49.2% of the total population, and 73.6% of those who used CAM because conventional medicine did not work. Older adults with depression were 3.5% of the population, and 11.3% of those who used CAM because conventional medicine did not work. Those with cancer were 14.5% of the total population, and 17.2% of those who used CAM because conventional medicine did not work. Collectively, the unadjusted results suggest that older adults with chronic conditions were considerably more likely than those without these conditions to use CAM because conventional medicine was not effective.

Conventional Medicine was Too Expensive

Those aged 50 and older who used CAM because conventional medicine was too expensive have a sample size of 472, representing about 4.0 million older people. Women were 53.8% of the total population, but 65.0% of those who used CAM because conventional medicine was too expensive. These unadjusted results suggest that women were considerably more likely than men to have used CAM because conventional medicine was too expensive. Those with an income-to-need ratio of 1 to 2 were 17.9% of the total population, but 25.6% of those used CAM because conventional medicine was too expensive. Those with musculoskeletal problems were 49.2% of the total population, but 70.6% of those used CAM because conventional medicine was too expensive. Those with depression were 3.5% of the total population, but 12.2% of those who used CAM because conventional medicine was too expensive.

Recommended by a Health Care Provider

Those aged 50 and older who use CAM because a health care provider recommended it have a sample size of 2,764, representing about 25.0 million older people. Women were 53.8% of the total population, but 64.3% of those used CAM because it was recommended by a health care provider. These unadjusted results suggest that women were considerably more likely than men to have used CAM because it was recommended by a provider. African Americans were 9.8% of the total population, but only 6.8% of those who used CAM because it was recommended by a provider. Those with musculoskeletal problems were 49.2% of the total population, but 62.1% of those who used CAM because it was recommended by a provider. Those with cancer were

14.5% of the total population, but 19.3% of those who used CAM because it was recommended by a provider. In results for most chronic conditions, there is suggestive evidence that those with chronic conditions may be more likely to have used CAM because it was recommended by a health care provider than those who do not have these conditions.

Recommended by Family or Friends or Co-Workers

Those aged 50 and older who used CAM because it was recommended by family, friends, or co-workers have a sample size of 2,209, representing about 20.2 million older people. Women were 53.8% of the total population, and 57.1% of those who used CAM because it was recommended by family, friends, or co-workers. African Americans were 9.8% of the total population, but 5.94% of those who used CAM because it was recommended by family, friends, or co-workers. Hispanics were 8.1% of the total population, but 4.9% of those who used CAM because it was recommended by family, friends, or co-workers. Whites were 77.6% of the total population, but 84.6% of those who used CAM because it was recommended by family, friends, or co-workers. Those with an income-to-need ratio less than 1 were 8.8% of the total population, but 5.2% of who those used CAM because it was recommended by family, friends, or co-workers. Those with musculoskeletal conditions were 49.2% of the total population, but 55.8% of those who used CAM because it was recommended by family, friends, or co-workers.

Unadjusted Results

Table 5 shows results of unadjusted logistic analyses of the likelihood that an individual would use CAM for each of the four reasons, focusing on the exposure

variables. For each result, Table 5 shows the odds ratio (OR) and upper and lower bounds of the 95% confidence interval (CI) as well as a symbol indicating the p-value.

For used CAM because conventional medicine did not work, the odds for women are 50% greater than the corresponding odds for a men (OR 1.5, CI 1.2-1.9). For used CAM because conventional medicine was too expensive, the odds for women are 60% greater than for men (OR 1.6, CI 1.3-2.0). The odds that those with an income-to-need ratio of 5+ is 50% lower than the corresponding odds for those with an income-to-need ratio of 3 to <4 (OR 0.5, CI 0.3-0.7). For used CAM because it was recommended by a health care provider, the odds for women are 80% greater than for men (OR 1.8, CI 1.6-2.1). The odds that an African American would use CAM because it was recommended by a health care provider are half those of Whites (OR 0.5, CI 0.5-0.6). For used CAM because it was recommended by family, friends, or co-workers: the odds for women are 20% greater than for men (OR 1.2, CI 1.1-1.3); the odds for African American are half those of Whites (OR 0.5, CI 0.4-0.6); the odds for Hispanics are also half those of Whites (OR 0.5, CI 0.4-0.6).

Adjusted Results

Adjusted results are reported in Table 6, which shows the OR, the 95% CI and p-value associated with each result.

Conventional Medicine Did Not Help

The adjusted odds that women used CAM because conventional medicine did not help were 34% higher than the corresponding odds for men (OR 1.34, CI 1.08-1.67). Those with a musculoskeletal condition had 2.93 higher odds (OR 2.93, CI 2.28-3.76) of

reporting that they used CAM because conventional medicine did not help. Those with depression had 2.35 higher odds (OR 2.35, CI 1.39-3.98) of reporting that they used CAM because conventional medicine did not help.

Conventional Medicine was Too Expensive

The adjusted odds that women would report using CAM because conventional medicine was too expensive were 49% higher than corresponding odds for men (OR 1.49, CI 1.17-1.91). The adjusted odds that African Americans would report using CAM because conventional medicine was too expensive were 39% lower than corresponding odds for Whites (OR 0.61, CI 0.40-0.93). The odds that older adults with an income-to-need ratio of 5+ would report using CAM because conventional medicine was too expensive were 45% lower than corresponding odds for an individual with an income-to-need ratio of 3 to <4 (OR 0.55, CI 0.34-0.88). Those who were uninsured had 2.7 higher odds of reporting CAM use because conventional medicine was too expensive than those with private insurance (OR 2.70, CI 1.88-3.87). The adjusted odds of using CAM because conventional medicine was too expensive were 2.31 higher for those with a musculoskeletal condition (OR 2.31, CI 1.79-2.98), and 2.16 higher for those with depression (OR 2.16, CI 1.44-3.24).

Recommended by a Health Care Provider

The adjusted odds that women would report using CAM because it was recommended by a health care provider were 96% higher than corresponding odds for men (OR 1.96, CI 1.72-2.24). The adjusted odds that African Americans would report using CAM because it was recommended by a health care provider were 38% lower than

the corresponding odds for Whites (OR 0.62, CI 0.53-0.72). The adjusted odds that older adults with several chronic conditions would report using CAM because it was recommended by a health care provider were significantly higher than the corresponding odds for those without these chronic conditions: for those with musculoskeletal conditions, 80% higher (OR 1.80, CI 1.59-2.03), for circulatory conditions, 38% higher (OR 1.38, CI 1.21-1.59) for depression, 44% higher (OR 1.44, CI 1.05-1.98), and for cancer, 33% higher (OR 1.33, CI 1.15-1.53).

Recommended by Family, Friends, or Co-workers

The adjusted odds that women would report using CAM because it was recommended by family, friends, or co-workers were 20% higher than the corresponding odds for men (OR 1.20, CI 1.07-1.36). The adjusted odds that Hispanics would report using CAM because it was recommended by family, friends, or co-workers were 42% lower than the corresponding odds for Whites (OR 0.58, CI 0.45-0.75). The adjusted odds that African Americans would report using CAM because it was recommended by family, friends, or co-workers were 39% lower than the corresponding odds for Whites (OR 0.61, CI 0.49-0.75). The adjusted odds that those with an income-to-need ratio ≤1 would report using CAM because it was recommended by family, friends, or co-workers were 38% lower than corresponding odds for those with an income-to-need ratio of 3 to <4 (OR 0.62, CI 0.47-0.81). The adjusted odds that those with cancer would report using CAM because it was recommended by family, friends, or co-workers were 25% higher than the corresponding odds for these without cancer (OR 1.25, CI 1.07-1.46).

Discussion

As America ages, an increasing number of older adults are likely to seek to improve their quality of life and better manage their chronic health problems through CAM use (Williamson, et al., 2003). Additionally, one of the fastest growing groups in the United States are minorities, particularly Hispanics, Asian Americans, and African Americans (Loera, et al., 2007). This analysis examined the prevalence of CAM use for four reasons among Americans age 50 and older, with a focus on differences associated with race/ethnicity, gender, and income.

Three hypothesis and one research question guided this research. The first hypothesis was that African Americans would be less likely than Whites to use CAM because it was recommended by a health care provider. The results provide strong evidence to support this hypothesis, and are consistent with previous research (Corbie-Smith, et al., 1999; Gamble, 1997; Wallace, et al., 2007; Zekeri & Habtemariam, 2006). The second expectation was that women would be more likely to use CAM than men a) if it is recommended by a health care provider, b) if conventional medicine does not work, and c) because conventional medicine is too expensive. The results support this hypothesis, and are consistent with previous research (Astin, 1998; Barraco, 2005; Brems, et al., 2006; Mueller, et al., 2008). The final hypothesis was that those with higher income would be less likely to use a CAM because conventional medicine was too expensive. The results support this hypothesis and are consistent with previous research (Fabbri & Monfardini, 2009).

This is the first study to examine use of CAM be older Americans because it was recommended by family, friends, or co-workers. The research question was, "What are

the characteristics of older people who used CAM because it was recommended by family, friends, or co-workers?" The results indicate that women are more likely than men to use CAM for this reason. African Americans are much less likely than Whites to use CAM because it was recommended by family, friends, or co-workers. Those in the lowest income category were considerably less likely than those with middle incomes to report using CAM because it was recommended by family, friends, or co-workers. Those with chronic conditions, especially with musculoskeletal conditions, depression, weight problems, or a cognitive problem, were more likely than others to report using CAM because it was recommended by family, friends, or co-workers.

It is not surprising that the odds of CAM use were higher for those with many of the included chronic conditions. As there are no cures for many chronic conditions, individuals with chronic conditions may be more likely to turn to CAM as a way of taking control and seek relief.

This study has several strengths; these strengths have been described previously (Tait, 2010). A major strength is the sample size and the fact that the study was based on a random nationally representative sample of the U.S, population, allowing estimation of results for a variety of subgroups for four relatively distinct reasons for CAM use. The large sample size allowed investigation of the association between CAM use in this population and self-reported health characteristics, such as health behaviors, chronic health conditions, income and health insurance coverage for four reasons for CAM use. The data also provided a useful set of measured variables to represent the theoretical constructs of the Andersen model, thus providing a reasonable set of controls for

potential confounding (Brown, 2009). It is important to acknowledge that this study makes no claims about the efficacy of CAM.

Several limitations are acknowledged (Tait, 2010). The data are cross sectional. Typically cross-sectional analyses do not provide a basis for inferring causality. In the present analysis, however, respondents identified barriers to health care and recommendations of others as the reasons they used CAM. Although inferences about causality in this instance depend on individuals' accurate assessments of their own motivations, in general it seems reasonable to judge that most respondents believed they used CAM for the reasons they provided. The validity of the data also depends on participants' memory and willingness to accurately report. Data were self reported in structured interviews. No validation study was done on the data after collection. Recall error is a possibility; however, limiting the recall to "past year" versus "ever" is likely to limit this potential source of bias.

About 30% of participants in the NHIS declined to participate in the supplemental CAM survey. This participation rate is acknowledged as a potential source of bias (Tait, 2010). CAM users may have been more motivated than non-users to discuss CAM, and more likely to participate. Thus, although the specific CAM supplement was separately weighted for national representativeness, the use of CAM among supplement participants may over-estimate CAM use in the general population. Similarly, results for the attribution of CAM use to the health care barriers and recommendations by others that were examined in this analysis might have been different if all NHIS respondents had participated in the CAM survey.

Implications for Policy, Practice, and Research

There is considerable variation in the use of CAM. African Americans were less likely than Whites to report using CAM because it was recommended by a health care provider. Women were more likely than men to report using CAM, women were more likely than men to use CAM because conventional medicine was too expensive, women were more likely than men to use CAM because conventional medicine did not work, and women were more likely than men to use CAM because a medical provider recommended it. People with lower income were more likely than those with middle income to report that they used CAM because conventional medicine was too expensive. Older Americans with chronic diseases such as depression, cancer, or arthritis and other musculoskeletal conditions, were more likely than others to report using CAM for all four reasons.

African Americans were less likely than Whites to report using CAM because it was recommended by a health care provider. It may be useful for providers to discuss possible advantages and disadvantages of CAM use with African American patients. Women were more likely than men to report using CAM because conventional medicine did not work, women were more likely than men to use CAM because conventional medicine was too expensive and women were more likely than men to use CAM because a medical provider recommended it. Health care providers need to be aware of this difference, understand what is working and what is not, as well as potential CAM solutions. Women were also more likely than men to report using CAM because conventional medicine was too expensive. Health care providers need to be aware of this

fiscal reality, and offer solutions for obtaining prescribed medications.

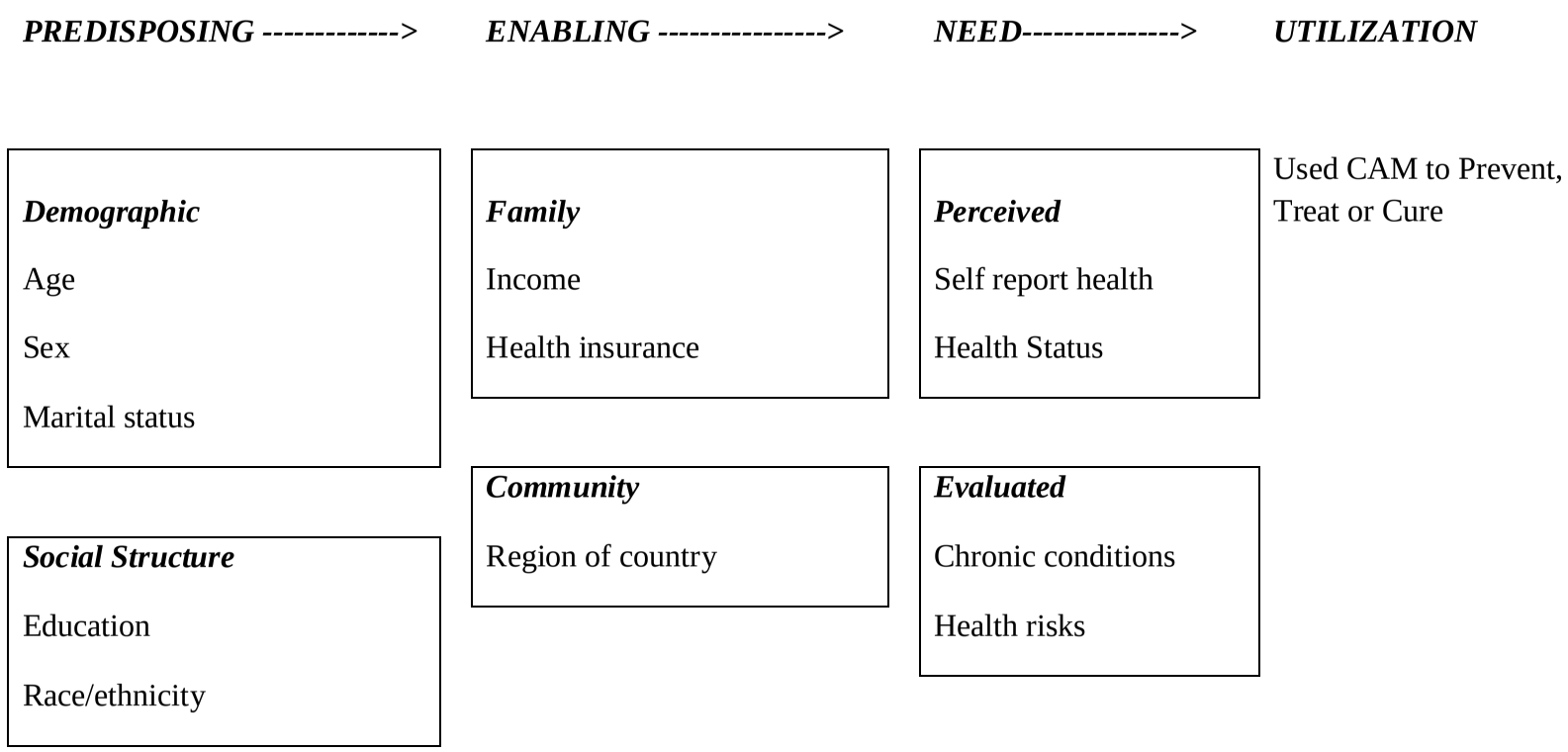
This is the first study to examine Americans' use of CAM as a result of recommendations by family, friends, or co-workers. African Americans were much less likely than Whites to report using CAM for this reason. Women were more likely than men to report using CAM for this reason. Those with less income were less likely than those with middle incomes to use CAM for this reason. Those with chronic conditions, especially with a musculoskeletal condition, depression, weight problems, or a cognitive problem were more likely to report using CAM for this reason. Family, friends, and co-workers are generally not knowledgeable about complex interactions of CAM and conventional therapies. Older adults often receive information about CAM therapies from the popular press and the Internet. The public health services might best educate the general public about CAM use with commercials and easily accessible web information.

In response to the new health care reform bill, The Patient Protection and Affordable Care Act, health care will increasingly be provided by interdisciplinary teams of health care providers including licensed complementary and alternative medicine practitioners (Patient Protection and Affordable Care Act, 2010). Coordination of care services, including CAM, will be provided for those who request it (Patient Protection and Affordable Care Act, 2010), making CAM that much more accessible to older Americans.

Based on these findings, health care providers need to understand that many Americans use CAM. Thus, it would be useful to offer some form of CAM training in schools for physicians, nurses, and other health care providers. Providing health care

providers with additional CAM training may help providers talk with patients about coordinating use of conventional medicine and CAM, reducing the risk of adverse reactions (Abbott, et al., 2010; Maclean, et al., 2003). It may be useful for providers to promote discussion about CAM with their patients. Such discussions might be especially useful for women, who are more likely to use CAM and may be at risk for adverse herb/drug interactions. They may also be useful for men and African Americans, who are less likely to use CAM and might benefit from certain CAM therapies. Those with less income, who might benefit from affordable CAM therapies, might also gain from such discussions, as well as from the clear communication that some herbs have adverse interactions with commonly used conventional medications.

Figure 4.1: Conceptual Model: from Andersen & Newman (Andersen, 1973)



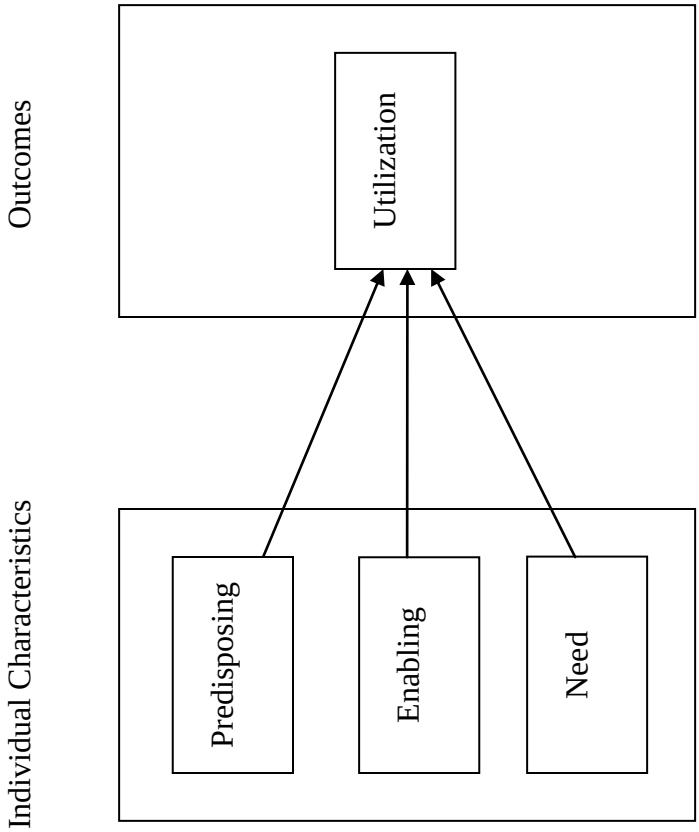


Figure 4.2: Graphical representation of Conceptual Model: from Andersen & Newman (Andersen, 1973)

Table 4.1: NHIS Measures Used to Identify the Presence of Chronic Conditions[a]

Condition	*NHIS Questions / Variables Used to Identify the Presence of the Condition*
Cancer	1. cancer causes difficulty with activity; 2. ever told by a doctor you had cancer; 3. cancer causes limitation?
Circulatory	1. ever been told you had a heart attack; 2. ever been told you had a heart condition/disease; 3. ever been told you had coronary heart disease; 4. had a heart attack, past 12 months; 5. had coronary heart disease, past 12 months; 6. had other heart condition, past 12 months; 7. heart problem causes difficulty with activity; 8. heart problem causes limitation; 9. ever been told you have hypertension; 10. had hypertension, past 12 months; 11. hypertension causes difficulty with activity; 12. hypertension causes limitation; 13. lung/breathing problem causes difficulty with activity; 14. lung/breathing problem causes limitation.
Depression	1. depression/anxiety/emotional problem causes difficulty with activity; 2. depression/anxiety/emotional problem causes limitation.
Endocrine, Nutrition, Metabolic	1. endocrine/nutritional/metabolic problem causes difficulty with activity; 2. endocrine/nutritional/metabolic problem causes limitation; 3. ever been told that you have diabetes; 4. diabetes causes difficulty with activity; 5. Diabetes causes limitation.
Memory / Cognition problems	1. Senility/dementia/Alzheimer's causes difficulty with activity 2. Had memory loss in the past 12 months 3. Is activity limited by difficulty remembering?

Table 4.1 (continued)

	4. Senility causes limitation 5. Ever been told you had dementia?
Musculoskeletal	1. musculoskeletal/connective tissue problem causes difficulty with activity; 2. arthritis/rheumatism causes difficulty with activity; 3. back/neck problem causes difficulty with activity; 4. fracture/bone/joint injury causes difficulty with activity; 5. ever been told you had arthritis; 6. ever told you had other joint condition; 7. musculoskeletal/connective tissue problem causes limitation; 8. arthritis/rheumatism causes limitation; 9. back/neck problem causes limitation; 10. fracture/bone/joint injury causes limitation.
Nervous, Sensory	1. nervous system/sensory organ condition causes difficulty with activity; 2. nervous system/sensory organ condition causes limitation; 3. vision problem causes difficulty with activity; 4. vision problem causes limitation; 5. hearing problem causes limitation; 6. hearing problem causes difficulty with activity; 7. ever been told you had a stroke; 8. had stroke, past 12 months; 9. stroke causes difficulty with activity; 10. stroke causes limitation.
Weight problems	1. weight problem causes limitation; 2. weight problem causes difficulty with activity.

[a]Data source: 2007 National Health Interview Survey.

Table 4.2: Frequencies for four Barrier and Influence reasons for using CAM given by women and men age 50 and older[a]

Tabulation Results For Each of The Four Barrier and Influence Variables	n	%	95% CI
Conventional medicine did not help	567	5.79	5.24, 6.35
Conventional medicine was Too Expensive	472	4.47	4.00, 4.95
Recommended by a health care provider	2764	26.63	26.63, 29.14
Recommended by family, friends, or co-workers	2209	22.51	21.39, 23.63

[a]Data source: 2007 National Health Interview Survey. Percentages account for the complex survey design, and are weighted for national representation. CI=Confidence Interval for the percent.

Table 4.3: Characteristics of Women and Men Ages 50 And Older Who Used CAM That Pertain To Barriers in the Last 12 Months, 2007 National Health Interview Survey[a]

	Age 50 and Older				Age 50 and Older Who Use a CAM Because Conventional Medicine did not Work.				Age 50 and Older Who Use a CAM Because a Traditional Medicine was too Expensive.			
	n = 10,096				n = 567				n = 472			
	n	N	%	CI	n	N	%	CI	n	N	%	CI
Gender					0	0						
Women	5,734	48,200,788	53.8	52.7, 55.0	372	3,278,501	63.2	58.9, 67.4	318	2,605,701	65.0	61.6, 68.4
Men	4,362	41,362,861	46.2	45.0, 47.3	195	1,910,417	36.8	32.6, 41.1	154	1,401,735	35.0	31.6, 38.4
Race/Ethnicity												
Asian	398	3,321,341	3.7	3.2, 4.2	29	206,566	4.0	1.8, 6.2	19	156,018	3.9	2.4, 5.4
African Americans	1,467	8,757,149	9.8	9.0, 10.5	37	264,735	5.1	3.7, 6.6	52	321,036	8.0	6.3, 9.7
Hispanic	1,135	7,236,161	8.1	7.3, 8.9	44	272,676	5.3	4.0, 6.5	61	361,908	9.0	7.2, 10.9
White	7,011	69,478,798	77.6	76.4, 78.8	451	4,392,933	84.7	81.6, 87.7	336	3,133,557	78.2	75.3, 81.1
Other	85	770,200	0.9	0.5, 1.2	6	52,008	1.0	0.0, 2.0	4	34,917	0.9	0.0, 1.7
Income to Poverty Ratio												
less than 1	1,260	7,888,423	8.8	8.1, 9.5	78	461,365	8.9	6.8, 11.0	74	437,377	10.9	8.9, 13.0
1 to less than 2	2,070	16,016,480	17.9	17.0, 18.8	98	854,727	16.5	13.7, 19.3	125	1,025,562	25.6	22.1, 29.1
2 to less than 3	1,787	15,711,006	17.5	16.7, 18.4	113	973,318	18.8	15.7, 21.8	110	935,821	23.4	20.2, 26.5
3 to less than 4	1,222	11,036,082	12.3	11.6, 13.1	64	592,344	11.4	8.9, 13.9	59	552,961	13.8	11.3, 16.3
4 to less than 5	1,026	9,876,872	11.0	10.3, 11.8	61	588,546	11.3	8.7, 14.0	38	355,333	8.9	6.7, 11.0
5 and over	2,731	29,034,786	32.4	31.1, 33.8	153	1,718,618	33.1	28.3, 38.0	66	700,382	17.5	14.9, 20.0
Age Ranges												
50 to 54	2,109	20,840,800	23.3	22.2, 24.4	148	1,368,747	26.4	23.0, 29.8	121	1,127,318	28.1	25.3, 31.0
55 to 59	1,790	17,134,518	19.1	18.1, 20.2	118	1,086,693	20.9	17.5, 24.4	98	822,321	20.5	17.6, 23.5
60 to 64	1,617	15,458,379	17.3	16.3, 18.2	107	1,158,605	22.3	17.7, 26.9	80	755,754	18.9	15.9, 21.8

Table 4.3 (continued)

65 to 69	1,369	11,074,402	12.4	11.6, 13.1	74	614,620	11.8	9.5, 14.1	60	439,268	11.0	8.3, 13.6
70 to 75	1,047	8,172,237	9.1	8.5, 9.8	43	320,624	6.2	4.2, 8.2	50	421,957	10.5	7.9, 13.1
75 to 79	903	7,361,399	8.2	7.6, 8.8	36	300,268	5.8	4.0, 7.6	33	241,682	6.0	4.4, 7.7
80 to 84	718	5,508,044	6.1	5.6, 6.7	28	215,857	4.2	2.8, 5.5	16	119,087	3.0	2.0, 3.9
85+	543	4,013,870	4.5	4.0, 4.9	13	123,504	2.4	1.1, 3.7	14	80,049	2.0	1.5, 2.5
Insurance Status												
Uninsured	901	7,902,161	8.8	8.2, 9.5	51	433,688	8.4	6.2, 10.5	92	819,279	20.4	17.5, 23.4
Dual eligible	464	2,866,496	3.2	2.8, 3.6	34	265,659	5.1	3.2, 7.0	23	180,187	4.5	2.5, 6.5
Medicaid only	306	1,948,227	2.2	1.8, 2.5	21	127,956	2.5	1.7, 3.3	17	89,053	2.2	1.6, 2.9
Medicare only	1,473	10,978,064	12.3	11.5, 13.0	65	491,620	9.5	7.3, 11.7	63	553,782	13.8	11.7, 16.0
Medicare Plus	2,417	20,706,312	23.1	22.0, 24.2	127	1,099,261	21.2	17.8, 24.6	102	804,041	20.1	16.7, 23.4
Other Public Health Insurance	353	3,158,977	3.5	3.1, 4.0	26	245,503	4.7	3.1, 6.4	19	166,219	4.1	2.4, 5.9
Private Insurance	4,182	42,003,412	46.9	45.5, 48.3	243	2,525,231	48.7	43.9, 53.4	156	1,394,875	34.8	31.5, 38.1
Marital Status												
Never married	807	5,308,184	5.9	5.4, 6.5	38	266,887	5.1	3.6, 6.7	39	290,622	7.3	5.6, 9.0
Married	4,904	56,672,674	63.3	62.1, 64.4	260	3,063,423	59.0	55.1, 63.0	197	2,181,846	54.4	50.8, 58.1
Separated, Divorced, Widowed	4,324	27,213,161	30.4	29.3, 31.4	266	1,839,663	35.5	31.6, 39.3	236	1,534,968	38.3	34.6, 42.0
Marital Status Unknown	61	369,630	0.4	0.3, 0.5	3	18,945	0.4	0.0, 0.8	0	0	0.0	0.0, 0.0
Education Levels												
≤ 8	975	6,969,924	7.8	7.1, 8.4	24	244,692	4.7	3.0, 6.4	29	222,581	5.6	3.6, 7.5
8 – 12	1,078	8,585,841	9.6	8.9, 10.3	39	442,792	8.5	5.5, 11.5	49	424,818	10.6	8.1, 13.1
High school Diploma	4,689	42,139,526	47.0	45.8, 48.3	265	2,441,600	47.1	42.2, 51.9	263	2,196,372	54.8	51.5, 58.1
Associate's Degree	841	7,701,365	8.6	8.0, 9.2	64	523,999	10.1	8.0, 12.2	43	381,224	9.5	6.9, 12.1
Bachelor's Degree	1,454	13,928,284	15.6	14.6, 16.5	102	840,700	16.2	13.2, 19.2	52	451,259	11.3	9.4, 13.1
Master's, PhD, MD	948	9,347,681	10.4	9.6, 11.3	70	664,322	12.8	10.2, 15.4	31	286,970	7.2	5.2, 9.1
Education missing	111	891,028	1.0	0.8, 1.2	3	30,813	0.6	0.1, 1.1	5	44,212	1.1	0.4, 1.8

Table 4.3 (continued)

Health Risks												
Smoking	1,526	13,134,047	14.7	13.7, 15.6	80	765,365	14.8	10.6, 18.9	96	818,631	20.4	17.1, 23.8
Underweight	165	1,389,689	1.6	1.2, 1.9	6	43,151	0.8	0.2, 1.5	9	67,934	1.7	0.6, 2.7
Normal weight	3,120	27,310,502	30.5	29.5, 31.5	173	1,478,163	28.5	25.1, 31.9	147	1,177,941	29.4	25.3, 33.4
Overweight	3,630	32,875,431	36.7	35.5, 38.0	201	1,880,363	36.2	31.6, 40.9	156	1,258,567	31.4	27.8, 35.0
Obese	2,614	23,089,967	25.8	24.7, 26.9	168	1,581,079	30.5	26.3, 34.6	154	1,449,705	36.2	32.3, 40.1
BMI Missing	567	4,898,060	5.5	4.9, 6.0	19	206,162	4.0	1.9, 6.0	6	53,289	1.3	0.3, 2.4
Health Status												
Health better	1,536	13,773,136	15.4	14.5, 16.2	126	1,135,292	21.9	18.6, 25.2	81	674,929	16.8	13.8, 19.9
Health the same	7,308	65,294,290	72.9	71.8, 74.0	330	2,976,711	57.4	53.3, 61.5	300	2,548,811	63.6	60.3, 66.9
Health worse	1,156	9,770,225	10.9	10.2, 11.7	109	1,062,091	20.5	16.2, 24.7	90	778,097	19.4	16.9, 21.9
Health missed	96	725,998	0.8	0.6, 1.0	2	14,824	0.3	0.0, 0.7	1	5,599	0.1	0.1, 0.1
Self report health												
Excellent/very good/good health	7,755	70,113,574	78.3	77.3, 79.3	386	3,550,331	68.4	64.0, 72.8	314	2,697,742	67.3	64.0, 70.6
Fair/poor health	2,341	19,450,075	21.7	20.7, 22.7	181	1,638,587	31.6	27.2, 36.0	158	1,309,694	32.7	29.4, 36.0
Chronic conditions												
Musculoskeletal	5,060	44,024,954	49.2	48.0, 50.4	410	3,818,480	73.6	70.3, 76.9	322	2,828,810	70.6	67.2, 74.0
Endocrine, Nutrition, Metabolic	1,695	13,916,535	15.5	14.7, 16.4	93	838,266	16.2	13.1, 19.2	91	773,800	19.3	16.9, 21.7
Circulatory	5,750	49,346,483	55.1	53.9, 56.3	318	2,809,033	54.1	49.8, 58.4	266	2,208,508	55.1	51.6, 58.6
Depression	401	3,132,013	3.5	3.1, 3.9	66	590,578	11.4	7.3, 15.5	59	488,011	12.2	9.7, 14.6
Weight problems	265	2,290,674	2.6	2.2, 2.9	31	278,381	5.4	3.4, 7.3	26	296,312	7.4	5.0, 9.8
Cancer	1,462	13,005,807	14.5	13.7, 15.4	97	891,302	17.2	14.1, 20.2	68	552,029	13.8	11.1, 16.4
Nervous, Sensory	1,180	10,063,536	11.2	10.4, 12.0	93	816,470	15.7	12.5, 19.0	64	575,165	14.4	12.3, 16.4
Memory / Cognition problems	1,121	9,041,793	10.1	9.4, 10.8	95	783,787	15.1	12.1, 18.1	77	655,275	16.4	13.6, 19.1
Region												
Northeast	1,774	15,932,559	17.8	16.6, 19.0	86	700,148	13.5	11.7, 15.3	64	559,652	14.0	12.3, 15.7

Table 4.3 (continued)

Midwest	2,338	22,084,078	24.7	23.0, 26.3	130	1,277,596	24.6	20.7, 28.5	114	912,952	22.8	20.7, 24.9
South	3,696	31,988,486	35.7	34.0, 37.5	160	1,508,633	29.1	26.1, 32.0	159	1,455,659	36.3	33.8, 38.8
West	2,288	19,558,526	21.8	20.5, 23.2	191	1,702,541	32.8	29.3, 36.3	135	1,079,173	26.9	24.5, 29.4

[a]Data source: 2007 National Health Interview Survey. Percentages account for the complex survey design, and are weighted for national representation. CI=Confidence Interval..

Table 4.4: Characteristics of Women And Men Ages 50 And Older Who Used A CAM That Pertain To Recommendations in the Last 12 Months, 2007 National Health Interview Survey[a]

	Age 50 and Older				Age 50 and Older Who Use a CAM Because a Health Provider Recommended It.				Age 50 and Older Who Use a CAM Because it was Recommended by Family, Friends or Co-workers.			
	n = 10,096				n = 2,764				n = 2,209			
	n	N	%	CI	n	N	%	CI	n	N	%	CI
Gender												
Women	5,734	48,200,788	53.8	52.7, 55.0	1,836	16,069,317	64.3	62.1, 66.6	1,321	11,502,893	57.1	54.8, 59.4
Men	4,362	41,362,861	46.2	45.0, 47.3	928	8,904,860	35.7	33.4, 37.9	888	8,654,732	42.9	40.6, 45.2
Race/Ethnicity												
Asian	398	3,321,341	3.7	3.2, 4.2	99	797,371	3.2	2.4, 3.9	92	801,265	4.0	3.0, 4.9
African Americans	1,467	8,757,149	9.8	9.0, 10.5	293	1,686,598	6.8	5.9, 7.6	184	1,197,307	5.9	4.9, 7.0
Hispanic	1,135	7,236,161	8.1	7.3, 8.9	219	1,286,056	5.1	4.2, 6.1	161	987,074	4.9	3.9, 5.9
White	7,011	69,478,798	77.6	76.4, 78.8	2,143	21,139,765	84.6	83.2, 86.1	1,755	17,046,122	84.6	82.9, 86.2
Other	85	770,200	0.9	0.5, 1.2	10	64,387	0.3	0.1, 0.4	17	125,857	0.6	0.3, 0.9
Income to Poverty Ratio												
less than 1	1,260	7,888,423	8.8	8.1, 9.5	281	1,730,027	6.9	5.9, 8.0	172	1,051,325	5.2	4.3, 6.1
1 to less than 2	2,070	16,016,480	17.9	17.0, 18.8	508	3,913,826	15.7	14.0, 17.3	341	2,633,001	13.1	11.5, 14.6
2 to less than 3	1,787	15,711,006	17.5	16.7, 18.4	516	4,582,518	18.3	16.6, 20.1	393	3,452,741	17.1	15.4, 18.9
3 to less than 4	1,222	11,036,082	12.3	11.6, 13.1	333	2,925,245	11.7	10.3, 13.1	300	2,622,066	13.0	11.6, 14.4
4 to less than 5	1,026	9,876,872	11.0	10.3, 11.8	308	2,927,593	11.7	10.3, 13.2	251	2,477,880	12.3	11.0, 13.6
5 and over	2,731	29,034,786	32.4	31.1, 33.8	818	8,894,968	35.6	33.2, 38.0	752	7,920,612	39.3	36.8, 41.8

Table 4.4 (continued)

Age Range												
50 to 54	2,109	20,840,800	23.3	22.2, 24.4	494	4,919,465	19.7	18.0, 21.4	509	5,136,516	25.5	23.5, 27.5
55 to 59	1,790	17,134,518	19.1	18.1, 20.2	440	4,330,763	17.3	15.5, 19.2	422	4,128,303	20.5	18.7, 22.3
60 to 64	1,617	15,458,379	17.3	16.3, 18.2	469	4,788,386	19.2	17.5, 20.9	366	3,478,072	17.3	15.6, 18.9
65 to 69	1,369	11,074,402	12.4	11.6, 13.1	372	3,088,605	12.4	11.1, 13.7	300	2,459,497	12.2	10.8, 13.6
70 to 75	1,047	8,172,237	9.1	8.5, 9.8	319	2,577,354	10.3	9.1, 11.6	194	1,541,632	7.6	6.6, 8.7
75 to 79	903	7,361,399	8.2	7.6, 8.8	269	2,200,318	8.8	7.7, 9.9	175	1,566,217	7.8	6.5, 9.0
80 to 84	718	5,508,044	6.1	5.6, 6.7	224	1,706,869	6.8	5.8, 7.9	140	1,017,441	5.0	4.1, 6.0
85+	543	4,013,870	4.5	4.0, 4.9	177	1,362,417	5.5	4.6, 6.3	103	829,947	4.1	3.1, 5.1
Insurance Status												
Uninsured	901	7,902,161	8.8	8.2, 9.5	141	1,262,953	5.1	4.1, 6.0	165	1,429,567	7.1	5.9, 8.3
Dual eligible	464	2,866,496	3.2	2.8, 3.6	133	851,636	3.4	2.6, 4.2	63	373,978	1.9	1.3, 2.4
Medicaid only	306	1,948,227	2.2	1.8, 2.5	68	437,700	1.8	1.3, 2.2	38	280,595	1.4	0.8, 2.0
Medicare only	1,473	10,978,064	12.3	11.5, 13.0	373	2,738,583	11.0	9.6, 12.3	267	2,081,856	10.3	8.8, 11.8
Medicare Plus	2,417	20,706,312	23.1	22.0, 24.2	870	7,552,233	30.2	28.2, 32.3	552	4,689,415	23.3	21.3, 25.2
Other Public Health Insurance	353	3,158,977	3.5	3.1, 4.0	96	915,324	3.7	2.9, 4.4	81	752,797	3.7	2.9, 4.6
Private Insurance	4,182	42,003,412	46.9	45.5, 48.3	1,083	11,215,748	44.9	42.6, 47.2	1,043	10,549,417	52.3	49.8, 54.8
Marital Status												
Never married	807	5,308,184	5.9	5.4, 6.5	178	1,142,975	4.6	3.8, 5.4	158	1,084,264	5.4	4.5, 6.3
Married	4,904	56,672,674	63.3	62.1, 64.4	1,356	16,037,303	64.2	61.9, 66.5	1,137	13,101,998	65.0	62.8, 67.2
Separated, Divorced, Widowed	4,324	27,213,161	30.4	29.3, 31.4	1,217	7,717,575	30.9	28.9, 32.9	907	5,936,595	29.5	27.5, 31.4
Marital Status Unknown	61	369,630	0.4	0.3, 0.5	13	76,324	0.3	0.1, 0.5	7	34,768	0.2	0.0, 0.3
Education Levels												
≤ 8	975	6,969,924	7.8	7.1, 8.4	196	1,475,613	5.9	4.9, 6.9	116	911,644	4.5	3.4, 5.7
8 – 12	1,078	8,585,841	9.6	8.9, 10.3	253	2,124,016	8.5	7.2, 9.8	148	1,312,432	6.5	5.3, 7.7
High school Diploma	4,689	42,139,526	47.0	45.8, 48.3	1,294	11,606,702	46.5	44.2, 48.7	1,051	9,501,468	47.1	44.4, 49.9

Table 4.4 (continued)

Associate's Degree	841	7,701,365	8.6	8.0, 9.2	263	2,367,880	9.5	8.3, 10.7	224	2,043,655	10.1	8.7, 11.6
Bachelor's Degree	1,454	13,928,284	15.6	14.6, 16.5	430	4,153,160	16.6	15.0, 18.2	381	3,631,505	18.0	16.1, 20.0
Master's, PhD, MD	948	9,347,681	10.4	9.6, 11.3	316	3,155,217	12.6	10.9, 14.4	282	2,695,035	13.4	11.7, 15.0
Education missing	111	891,028	1.0	0.8, 1.2	12	91,589	0.4	0.1, 0.6	7	61,886	0.3	0.1, 0.6
Health Risks												
Smoking	1,526	13,134,047	14.7	13.7, 15.6	350	3,031,629	12.1	10.7, 13.6	315	2,686,555	13.3	11.8, 14.9
Underweight	165	1,389,689	1.6	1.2, 1.9	46	319,361	1.3	0.8, 1.7	25	194,457	1.0	0.5, 1.4
Normal weight	3,120	27,310,502	30.5	29.5, 31.5	916	8,083,911	32.4	30.2, 34.5	743	6,671,192	33.1	30.8, 35.3
Overweight	3,630	32,875,431	36.7	35.5, 38.0	980	9,037,535	36.2	33.7, 38.6	812	7,504,604	37.2	35.1, 39.4
Obese	2,614	23,089,967	25.8	24.7, 26.9	746	6,827,652	27.3	25.4, 29.3	566	5,219,959	25.9	23.9, 27.9
BMI Missing	567	4,898,060	5.5	4.9, 6.0	76	705,718	2.8	2.0, 3.6	63	567,413	2.8	2.1, 3.6
Health Status												
Health better	1,536	13,773,136	15.4	14.5, 16.2	535	5,033,041	20.2	18.6, 21.7	430	4,038,940	20.0	18.2, 21.8
Health the same	7,308	65,294,290	72.9	71.8, 74.0	1,856	16,605,952	66.5	64.5, 68.4	1,527	14,054,786	69.7	67.7, 71.8
Health worse	1,156	9,770,225	10.9	10.2, 11.7	369	3,291,481	13.2	11.6, 14.8	249	2,045,487	10.1	8.8, 11.5
Health missed	96	725,998	0.8	0.6, 1.0	4	43,703	0.2	0.0, 0.4	3	18,412	0.1	0.0, 0.2
Excellent/very good/good health	7,755	70,113,574	78.3	77.3, 79.3	2,085	19,249,656	77.1	75.2, 78.9	1,819	16,788,205	83.3	81.5, 85.1
Fair/poor health	2,341	19,450,075	21.7	20.7, 22.7	679	5,724,521	22.9	21.1, 24.8	390	3,369,420	16.7	14.9, 18.5
Chronic conditions												
Musculoskeletal	5,060	44,024,954	49.2	48.0, 50.4	1,749	15,498,956	62.1	60.1, 64.0	1,251	11,239,927	55.8	53.5, 58.0
Endocrine, Nutrition, Metabolic	1,695	13,916,535	15.5	14.7, 16.4	507	4,269,469	17.1	15.4, 18.8	286	2,547,324	12.6	11.0, 14.2
Circulatory	5,750	49,346,483	55.1	53.9, 56.3	1,781	15,676,103	62.8	60.4, 65.1	1,199	10,650,937	52.8	50.5, 55.2
Depression	401	3,132,013	3.5	3.1, 3.9	154	1,255,858	5.0	3.9, 6.1	110	838,587	4.2	3.3, 5.0
Weight problems	265	2,290,674	2.6	2.2, 2.9	108	923,235	3.7	2.9, 4.5	79	763,015	3.8	2.9, 4.6
Cancer	1,462	13,005,807	14.5	13.7, 15.4	554	4,809,158	19.3	17.6, 20.9	383	3,412,144	16.9	15.2, 18.6

Table 4.4 (continued)

Nervous, Sensory	1,180	10,063,536	11.2	10.4, 12.0	409	3,556,738	14.2	12.7, 15.8	244	2,195,468	10.9	9.3, 12.5
Memory / Cognition problems	1,121	9,041,793	10.1	9.4, 10.8	372	3,077,339	12.3	11.0, 13.6	239	2,022,830	10.0	8.6, 11.5
Region												
Northeast	1,774	15,932,559	17.8	16.6, 19.0	86	700,148	13.5	11.7, 15.3	64	559,652	14.0	12.3, 15.7
Midwest	2,338	22,084,078	24.7	23.0, 26.3	130	1,277,596	24.6	20.7, 28.5	114	912,952	22.8	20.7, 24.9
South	3,696	31,988,486	35.7	34.0, 37.5	160	1,508,633	29.1	26.1, 32.0	159	1,455,659	36.3	33.8, 38.8
West	2,288	19,558,526	21.8	20.5, 23.2	191	1,702,541	32.8	29.3, 36.3	135	1,079,173	26.9	24.5, 29.4

[a]Data source: 2007 National Health Interview Survey. Percentages account for the complex survey design, and are weighted for national representation. CI=Confidence Interval.

Table 4.5: Unadjusted Results for reasons cited for CAM that pertain to Barriers and Recommendations in the Last 12 Months, among Women and Men age 50 and over, 2007 National Health Interview Survey[a]

	Conventional Medicine did not Work				Conventional Medicine too Expensive				Recommended by a Health care provider				Recommended by a Family, Friends, or Co-Workers			
Effect	OR	LB	UB	P-Value	OR	LB	UB	P-Value	OR	LB	UB	P-Value	OR	LB	UB	P-Value
Gender																
Women	1.5	1.2	1.9	***	1.6	1.3	2.0	***	1.8	1.6	2.1	***	1.2	1.1	1.3	**
Race/ethnicity																
Hispanic	0.6	0.4	0.9	**	1.1	0.8	1.6		0.5	0.4	0.6	***	0.5	0.4	0.6	***
Asian	1.0	0.5	1.8		1.0	0.6	1.9		0.7	0.5	1.0	*	1.0	0.7	1.3	
African American	0.5	0.3	0.7	***	0.8	0.6	1.1		0.5	0.5	0.6	***	0.5	0.4	0.6	***
Other	1.1	0.4	2.7		1.0	0.3	3.2		0.2	0.1	0.4	***	0.6	0.3	1.1	
Income-to-need ratio																
≤ 1	1.2	.8	1.7		1.3	0.9	2.0		0.7	0.6	0.9	**	0.5	0.4	0.6	***
1 to <	0.9	0.6	1.2		1.4	1.0	2.0	+	0.8	0.7	1.0	+	0.6	0.5	0.0	***
2 o < 3	1.1	0.8	1.5		1.3	0.9	1.8		1.1	0.9	1.3		0.9	0.7	1.1	
4 to < 5	1.1	0.7	1.6		0.8	0.5	1.2		1.1	0.9	.3		1.0	0.8	1.2	
5 +	1.0	0.7	1.5		0.5	0.3	0.7	***	1.1	0.9	1.3		1.1	1.0	1.3	

[a]Data source: 2007 National Health Interview Survey. OR=Odds Ratio; UB, LB=Upper and lower bounds of the 95% confidence interval. Reference categories: non-Hispanic White, men, ages 50-54, married, high school graduate, income-to-need ratio 3 to < 4, private health insurance, normal weight, health status unchanged in past 12 months, excellent/very good/good self-reported health, South. Public health insurance = not covered by Medicare, Medicaid, private health insurance, and not uninsured. *p<.05, **p<.01, ***p<.001

Table 4.6: Multivariate Logistic Analysis Predicting the Likelihood of Using a CAM during the Past 12 Months, Women and Men Ages 50 and Older, 2007[a]

	Conventional Medicine Did Not Help				Conventional Medicine Too Expensive				Recommended by Health Care Provider				Recommended by Family. Friends, or Co-workers			
	OR	***LB***	***UB***	***p-value***	***OR***	***LB***	***UB***	***p-value***	***OR***	***LB***	***UB***	***p-value***	***OR***	***LB***	***UB***	***p-value***
Gender																
Women	1.34	1.08	1.67	0.0083	1.49	1.17	1.91	0.0014	1.96	1.72	2.24	<.0001	1.20	1.07	1.36	0.0023
Men	1.00				1.00				1.00				1.00			
Race/Ethnicity																
White	1.00				1.00				1.00				1.00			
Hispanic	0.56	0.35	0.89	0.0151	0.95	0.63	1.44	0.8154	0.61	0.48	0.79	0.0001	0.58	0.45	0.75	<.0001
Asian	1.05	0.51	2.15	0.8948	1.16	0.62	2.18	0.6433	0.82	0.60	1.12	0.2148	1.02	0.74	1.41	0.8882
African American	0.46	0.30	0.70	0.0004	0.61	0.40	0.93	0.0218	0.62	0.53	0.72	<.0001	0.61	0.49	0.75	<.0001
Other	0.73	0.25	2.08	0.5504	0.67	0.20	2.19	0.5026	0.21	0.10	0.45	<.0001	0.64	0.35	1.18	0.1544
Income-to-need ratio																
≤ 1	0.83	0.52	1.33	0.4472	0.76	0.46	1.26	0.2939	0.79	0.60	1.04	0.0881	0.62	0.47	0.81	0.0004
1 to < 2	0.94	0.63	1.41	0.7705	1.13	0.76	1.67	0.5422	0.89	0.72	1.09	0.2433	0.73	0.60	0.90	0.0025
2 to < 3	1.20	0.82	1.77	0.3503	1.16	0.79	1.70	0.4632	1.12	0.93	1.36	0.2392	0.96	0.79	1.16	0.6561
3 to < 4	1.00				1.00				1.00				1.00			
4 to < 5	1.14	0.71	1.84	0.5898	0.77	0.48	1.24	0.2852	1.16	0.92	1.46	0.2051	1.05	0.85	1.29	0.6728
5 +	1.10	0.74	1.65	0.6276	0.55	0.34	0.88	0.0125	1.23	1.01	1.49	0.0376	1.08	0.90	1.29	0.394
Predisposing / Demographic																
Age Ranges																
ages 50 to 54	1.00				1.00				1.00				1.00			
ages 55 to 59	0.87	0.64	1.19	0.3889	0.89	0.63	1.24	0.4833	0.97	0.80	1.19	0.7972	0.93	0.80	1.09	0.3713
ages 60 to 64	0.96	0.67	1.37	0.8164	0.79	0.55	1.13	0.193	1.19	1.00	1.43	0.0569	0.82	0.69	0.98	0.0287

Table 4.6 (continued)

ages 65 to 69	0.59	0.37	0.95	0.0293	0.52	0.33	0.83	0.0054	0.73	0.56	0.96	0.023	0.83	0.65	1.06	0.1254
ages 70 to 74	0.36	0.21	0.63	0.0003	0.62	0.37	1.06	0.0782	0.81	0.61	1.07	0.142	0.65	0.50	0.85	0.0019
ages 75 to 79	0.34	0.19	0.62	0.0003	0.36	0.21	0.63	0.0003	0.64	0.47	0.86	0.0033	0.71	0.53	0.95	0.0232
ages 80 to 84	0.32	0.17	0.60	0.0005	0.23	0.11	0.48	<.0001	0.70	0.51	0.98	0.0344	0.63	0.45	0.87	0.0046
85 and older	0.22	0.11	0.44	<.0001	0.21	0.10	0.44	<.0001	0.76	0.54	1.08	0.1256	0.67	0.46	0.96	0.0306
Marital status																
Married	1.00				1.00				1.00				1.00			
Never Married	1.01	0.65	1.55	0.9789	1.29	0.80	2.08	0.3036	0.87	0.69	1.09	0.2197	1.04	0.83	1.29	0.7546
Separated, Divorced, Widowed	1.32	1.04	1.66	0.0222	1.18	0.90	1.53	0.231	0.92	0.81	1.04	0.1585	1.08	0.96	1.22	0.2067
Marital Status Unknown	1.44	0.36	5.77	0.6076	<0.001	<0.001	<0.001	<.0001	1.24	0.48	3.17	0.6587	0.53	0.21	1.32	0.175
Predisposing / Social Structure																
Education Levels																
≤ 8	0.74	0.42	1.33	0.3162	0.55	0.33	0.91	0.021	0.89	0.70	1.13	0.3332	0.78	0.57	1.05	0.0988
8 – 12	0.95	0.62	1.46	0.8289	0.83	0.57	1.21	0.3272	0.93	0.77	1.13	0.4815	0.76	0.62	0.94	0.0101
High School Diploma	1.00				1.00				1.00				1.00			
Associate's Degree	1.15	0.82	1.61	0.4207	1.00	0.67	1.50	0.9893	1.16	0.96	1.40	0.1159	1.13	0.91	1.41	0.2541
Bachelor's Degree	1.17	0.83	1.65	0.3722	0.88	0.62	1.26	0.4989	1.18	1.01	1.38	0.0381	1.07	0.89	1.28	0.4732
Master's, PhD, MD	1.39	0.98	1.95	0.0619	0.93	0.58	1.49	0.7663	1.40	1.12	1.75	0.0032	1.21	0.99	1.47	0.0584
Education missing	0.94	0.28	3.16	0.9133	1.32	0.48	3.60	0.5906	0.48	0.23	1.01	0.0524	0.41	0.19	0.92	0.0295
Enabling / Family																
Insurance Coverage																
Private Health Insurance	1.00				1.00				1.00				1.00			
Dual eligible	1.87	1.03	3.42	0.041	1.65	0.82	3.32	0.1569	1.55	1.03	2.35	0.0373	0.82	0.55	1.23	0.337
Medicaid only	0.99	0.47	2.09	0.9785	0.88	0.47	1.65	0.6959	1.10	0.72	1.68	0.6618	0.97	0.59	1.58	0.8899
Medicare only	1.22	0.77	1.91	0.3977	1.87	1.10	3.19	0.0205	1.20	0.93	1.55	0.1581	1.07	0.83	1.37	0.6142
Medicare Plus	1.44	0.96	2.18	0.0809	1.60	1.02	2.52	0.043	1.77	1.40	2.25	<.0001	1.09	0.87	1.37	0.4505

Table 4.6 (continued)

public health insurance	1.38	0.88	2.16	0.1665	1.38	0.76	2.49	0.2914	1.35	1.00	1.82	0.049	1.16	0.86	1.57	0.3331
Uninsured	0.98	0.64	1.49	0.929	2.70	1.88	3.87	<.0001	0.71	0.55	0.92	0.0096	0.94	0.75	1.19	0.6051
Enabling / Community																
Region																
South	1.00				1.00				1.00				1.00			
Northeast	0.97	0.71	1.33	0.8604	0.87	0.64	1.17	0.343	1.03	0.87	1.21	0.7722	0.97	0.81	1.17	0.7558
Midwest	1.18	0.87	1.61	0.2772	0.92	0.65	1.29	0.612	1.19	1.00	1.41	0.0453	1.00	0.84	1.19	0.9646
West	1.87	1.43	2.44	<.0001	1.19	0.88	1.61	0.2508	1.35	1.13	1.62	0.0012	1.44	1.21	1.72	<.0001
Need / Perceived																
Health Status																
Health same	1.00				1.00				1.00				1.00			
Health better	1.62	1.26	2.08	0.0002	1.13	0.84	1.51	0.4191	1.59	1.38	1.83	<.0001	1.46	1.26	1.70	<.0001
Health worse	1.69	1.21	2.35	0.0019	1.37	0.99	1.89	0.0584	1.21	1.00	1.48	0.0544	1.02	0.83	1.26	0.8466
Health status missing	0.47	0.08	2.80	0.406	0.55	0.07	4.32	0.5662	0.30	0.09	0.95	0.0412	0.17	0.05	0.57	0.0045
Self reported health																
Excellent/very good/good health	1.00				1.00				1.00				1.00			
Fair/Poor	1.40	1.02	1.94	0.0392	1.10	0.81	1.50	0.5273	0.92	0.78	1.09	0.3548	0.76	0.63	0.92	0.0041
Need / Evaluated																
Health Risks																
Smoking	0.74	0.53	1.02	0.0613	1.02	0.75	1.39	0.9084	0.79	0.68	0.92	0.003	0.87	0.74	1.03	0.1004
Normal weight	1.00				1.00				1.00				1.00			
Underweight	0.62	0.23	1.69	0.3463	1.24	0.59	2.65	0.5705	0.70	0.45	1.07	0.0964	0.61	0.35	1.05	0.074
Overweight	1.07	0.82	1.39	0.636	0.93	0.68	1.27	0.6585	0.97	0.83	1.13	0.6582	0.95	0.82	1.09	0.4351
Obese	0.99	0.73	1.33	0.9247	1.08	0.79	1.48	0.6399	0.86	0.72	1.01	0.0719	0.89	0.75	1.05	0.1771
BMI Missing	0.74	0.40	1.37	0.3324	0.20	0.08	0.53	0.0012	0.39	0.27	0.57	<.0001	0.47	0.34	0.65	<.0001

Table 4.6 (continued)

Chronic conditions

Musculoskeletal	2.93	2.28	3.76	<.0001	2.31	1.79	2.98	<.0001	1.80	1.59	2.03	<.0001	1.59	1.40	1.80	<.0001
Endocrine, Nutrition, Metabolic	0.86	0.64	1.14	0.278	1.05	0.78	1.40	0.7685	1.09	0.92	1.28	0.3177	0.84	0.70	1.00	0.0457
Circulatory	0.77	0.61	0.97	0.0295	0.81	0.62	1.05	0.1046	1.38	1.21	1.59	<.0001	0.95	0.84	1.08	0.4237
Depression	2.35	1.39	3.98	0.0014	2.16	1.44	3.24	0.0002	1.44	1.05	1.98	0.0233	1.30	0.95	1.77	0.1062
Weight problems	1.23	0.76	1.98	0.4031	1.91	1.15	3.18	0.013	1.29	0.91	1.82	0.1489	1.67	1.21	2.32	0.002
Cancer	1.19	0.90	1.57	0.2279	0.95	0.69	1.32	0.7613	1.33	1.15	1.53	0.0001	1.25	1.07	1.46	0.0043
Nervous, Sensory	1.09	0.77	1.53	0.6266	0.84	0.59	1.21	0.3507	1.15	0.95	1.38	0.1461	1.02	0.81	1.29	0.8534
Memory / Cognition problems	1.10	0.77	1.57	0.6075	1.19	0.81	1.74	0.3723	1.15	0.95	1.39	0.1618	1.24	0.98	1.56	0.0691

[a]Data source: 2007 National Health Interview Survey. UB, LB=Upper and lower bounds of the 95% confidence interval. Reference categories: men, White, ages 50-54, married, high school graduate, income-to-need ratio 3 to < 4, private health insurance, normal weight, health status unchanged in past 12 months, excellent/very good/good self-reported health, South. Public health insurance = not covered by Medicare, Medicaid, private health insurance, and not uninsured.

Exhibit 1: The Four 2007 National Health Interview Survey question groupings pertaining to Recommendations and barriers.

Because traditional medication was too expensive:

1. DURING THE PAST 12 MONTHS, did you use massage for any of these reasons?
2. DURING THE PAST 12 MONTHS, did you use ayurveda for any of these reasons?
3. DURING THE PAST 12 MONTHS, did you use hypnosis for any of these reasons?
4. DURING THE PAST 12 MONTHS, did you use acupuncture for any of these reasons?
5. DURING THE PAST 12 MONTHS, did you use biofeedback for any of these reasons?
6. DURING THE PAST 12 MONTHS, did you use naturopathy for any of these reasons?
7. DURING THE PAST 12 MONTHS, did you use the [fill: diet used most] diet for any of these reasons?
8. DURING THE PAST 12 MONTHS, did you use chelation therapy for any of these reasons?
9. DURING THE PAST 12 MONTHS, did you see [fill: type of traditional healer] for any of these reasons?
10. DURING THE PAST 12 MONTHS, did you use [fill: type of movement technique] for any of these reasons?
11. DURING THE PAST 12 MONTHS, did you use homeopathic treatment for any of these reasons?
12. DURING THE PAST 12 MONTHS, did you use energy healing therapy for any of these reasons?
13. DURING THE PAST 12 MONTHS, did you use [fill relaxation technique used most] for any of these reasons?
14. Did you use [fill: 1st herb] for any of these reasons?
15. Did you use [fill: 2nd herb] for any of these reasons?
16. Did you use [fill: 1st vitamin] for any of these reasons?
17. Did you use [fill: 2nd vitamin] for any of these reasons?
18. DURING THE PAST 12 MONTHS, did you practice [fill: practice used most] for any of these reasons?
19. DURING THE PAST 12 MONTHS, did you use chiropractic or osteopathic manipulation for any of these reasons?
20. Did you use [fill: 1st herb] for any of these reasons?
21. Did you use [fill: 2nd herb] for any of these reasons?
22. Did you use [fill: 1st vitamin] for any of these reasons?
23. Did you use [fill: 2nd vitamin] for any of these reasons?

Traditional medicine did not help:

1. DURING THE PAST 12 MONTHS, did you use massage for any of these reasons? ...Because medical treatments did not help
2. DURING THE PAST 12 MONTHS, did you use ayurveda for any of these reasons? ...Because medical treatments did not help
3. DURING THE PAST 12 MONTHS, did you use hypnosis for any of these reasons? ...Because medical treatments did not help
4. DURING THE PAST 12 MONTHS, did you use acupuncture for any of these reasons? ...Because medical treatments did not help
5. DURING THE PAST 12 MONTHS, did you use biofeedback for any of these reasons? ...Because medical treatments did not help
6. DURING THE PAST 12 MONTHS, did you use naturopathy for any of these reasons? ...Because medical treatments did not help
7. DURING THE PAST 12 MONTHS, did you use the [fill: diet used most] diet for any of these reasons? ...Because medical treatments did not help
8. DURING THE PAST 12 MONTHS, did you use chelation therapy for any of these reasons? ...Because medical treatments did not help
9. DURING THE PAST 12 MONTHS, did you see [fill: type of traditional healer] for any of these reasons?...Because medical treatments did not help
10. DURING THE PAST 12 MONTHS, did you use [fill: type of movement technique] for any of these reasons?...Because medical treatments did not help
11. DURING THE PAST 12 MONTHS, did you use homeopathic treatment for any of these reasons? ...Because medical treatments did not help
12. DURING THE PAST 12 MONTHS, did you use energy healing therapy for any of these reasons?...Because medical treatments did not help
13. DURING THE PAST 12 MONTHS, did you use [fill relaxation technique used most] for any of these reasons? ...Because medical treatments did not help
14. Did you use [fill: 1st herb] for any of these reasons?...Because medical treatments did not help?
15. Did you use [fill: 2nd herb] for any of these reasons?
16. Did you use [fill: 1st vitamin] for any of these reasons?...Because medical treatments did not help?
17. Did you use [fill: 2nd vitamin] for any of these reasons?...Because medical treatments did not help?
18. DURING THE PAST 12 MONTHS, did you practice [fill: practice used most] for any of these reasons? ...Because medical treatments did not help?
19. DURING THE PAST 12 MONTHS, did you use chiropractic or osteopathic manipulation for any of these reasons? ....Because medical treatments did not help

Recommended by family, friends, or co-workers:

1. DURING THE PAST 12 MONTHS, did you use massage for any of these reasons?...It was recommended by family, friends, or co-workers
2. DURING THE PAST 12 MONTHS, did you use ayurveda for any of these reasons?...It was recommended by family, friends, or co-workers

3. DURING THE PAST 12 MONTHS, did you use hypnosis for any of these reasons?...It was recommended by family, friends, or co-workers
4. DURING THE PAST 12 MONTHS, did you use acupuncture for any of these reasons? ...It was recommended by family, friends, or co-workers
5. DURING THE PAST 12 MONTHS, did you use biofeedback for any of these reasons? ...It was recommended by family, friends, or co-workers
6. DURING THE PAST 12 MONTHS, did you use naturopathy for any of these reasons? ...It was recommended by family, friends, or co-workers
7. DURING THE PAST 12 MONTHS, did you use the [fill: diet used most] diet for any of these reasons? ...It was recommended by family, friends, or co-workers
8. DURING THE PAST 12 MONTHS, did you use chelation therapy for any of these reasons? ...It was recommended by family, friends, or co-workers
9. DURING THE PAST 12 MONTHS, did you see [fill: type of traditional healer] for any of these reasons?...It was recommended by family, friends, or co-workers
10. DURING THE PAST 12 MONTHS, did you use [fill: type of movement technique] for any of these reasons?...It was recommended by family, friends, or co-workers
11. DURING THE PAST 12 MONTHS, did you use homeopathic treatment for any of these reasons? ...It was recommended by family, friends, or co-workers
12. DURING THE PAST 12 MONTHS, did you use energy healing therapy for any of these reasons? ...It was recommended by family, friends, or co-workers
13. DURING THE PAST 12 MONTHS, did you use [fill relaxation technique used most] for any of these reasons?...It was recommended by family friends or coworkers
14. Did you use [fill: 1st herb] for any of these reasons?...It was recommended by family, friends, or co-workers?
15. Did you use [fill: 2nd herb] for any of these reasons?,,,It was recommended by family, friends, or co-workers?
16. Did you use [fill: 1st vitamin] for any of these reasons?...It was recommended by family, friends, or co-workers?
17. Did you use [fill: 2nd vitamin] for any of these reasons?...It was recommended by family, friends, or co-workers?
18. DURING THE PAST 12 MONTHS, did you practice [fill: practice used most] for any of these reasons?...It was recommended by family, friends, or co-workers?
19. DURING THE PAST 12 MONTHS, did you use chiropractic or osteopathic manipulation for any of these reasons?...It was recommended by family, friends, or co-workers

Recommended by a health care provider:

1. DURING THE PAST 12 MONTHS, did you use massage for any of these reasons? ...It was recommended by a health care provider
2. DURING THE PAST 12 MONTHS, did you use ayurveda for any of these reasons? ...It was recommended by a health care provider
3. DURING THE PAST 12 MONTHS, did you use hypnosis for any of these reasons? ...It was recommended by a health care provider
4. DURING THE PAST 12 MONTHS, did you use acupuncture for any of these reasons? ...It was recommended by a health care provider
5. DURING THE PAST 12 MONTHS, did you use biofeedback for any of these reasons? ...It was recommended by a health care provider
6. DURING THE PAST 12 MONTHS, did you use naturopathy for any of these reasons? ...It was recommended by a health care provider
7. DURING THE PAST 12 MONTHS, did you use the [fill: diet used most] diet for any of these reasons?... It was recommended by a health care provider
8. DURING THE PAST 12 MONTHS, did you use chelation therapy for any of these reasons? ...It was recommended by a health care provider
9. DURING THE PAST 12 MONTHS, did you see [fill: type of traditional healer] for any of these reasons?...It was recommended by a health care provider
10. DURING THE PAST 12 MONTHS, did you use [fill: type of movement technique] for any of these reasons?...It was recommended by a health care provider
11. DURING THE PAST 12 MONTHS, did you use homeopathic treatment for any of these reasons? ...It was recommended by a health care provider
12. DURING THE PAST 12 MONTHS, did you use energy healing therapy for any of these reasons?...It was recommended by a health care provider
13. DURING THE PAST 12 MONTHS, did you use [fill relaxation technique used most] for any of these reasons?...It was recommended by a health care provider
14. Did you use [fill: 1st herb] for any of these reasons?...It was recommended by a health care provider?
15. Did you use [fill: 2nd vitamin] for any of these reasons?...It was recommended by a health care provider?
16. Did you use [fill: 2nd herb] for any of these reasons?,,,It was recommended by a health care provider?
17. Did you use [fill: 1st vitamin] for any of these reasons?...It was recommended by a health care provider?
18. DURING THE PAST 12 MONTHS, did you practice [fill: practice used most] for any of these reasons?...It was recommended by a health care provider?
19. DURING THE PAST 12 MONTHS, did you use chiropractic or osteopathic manipulation for any of these reasons?...It was recommended by a health care provider

CHAPTER 5: USE OF COMPLEMENTARY AND ALTERNATIVE MEDICINE BY OLDER AMERICANS FOR PHYSICAL PERFORMANCE, ENERGY, IMMUNE FUNCTION, AND GENERAL HEALTH

Introduction

People ages 50 and older are the largest consumers of medical services, including provider services, hospital services, and pharmaceuticals (Administration on Aging, 2010; Barnes, Powell-Griner, & McFannk, 2004; Mueller, et al., 2008). A substantial number of people may substitute complementary and alternative medicine (CAM) for medical services (Cuellar & Aycock, 2003). A better understanding of CAM use by older patients would also help providers to caution against CAM use when adverse interactions with conventional medicine are likely (Rhee, 2004), or to recommend CAM when conventional therapies are ineffective or when CAM may hold promise as a cost effective alternative (Fink, 2002).

The National Center for Complementary and Alternative Medicine (NCCAM), a unit of the National Institutes of Health, defines CAM as medical care practices, services, and products that are not usually grouped with conventional medicine. CAM is variously called "complementary," "alternative," or "integrative" medicine. These types are can be distinguished by the use of the practice, service, or product. CAM used in conjunction with conventional medicine is "complementary" or "integrative" (Barnes, et al., 2008). CAM used instead of conventional medicine is "alternative." NCCAM categorizes CAM as: (1) energy medicine, (2) manipulative and body-based practices, (3) biologically

based practices, and (4) mind-body medicine. Many types of CAM have been used by other cultures for centuries (Fennell, et al., 2009).

Use of CAM has increased substantially in the U.S. over the past four decades (Eisenberg & Davis, 1998). Societal trends toward increasing participation in health care decision making, and increased availability of medical information on the Internet, have contributed to this trend (McCaffrey, et al., 2007). CAM is sometimes defined to include use of vitamins or prayer for health, and sometimes without these categories. Eisenberg and colleagues found an almost 10% increase in CAM use between 1990 and 1997 (Eisenberg & Davis, 1998). In a descriptive study of data from the 2007 National Health Interview Survey (NHIS), excluding use of vitamins and prayer for health, researchers found that 38.3% of American adults used CAM, compared with 36% reporting use in 2002 (NCCAM, 2008). As with the general population, older adults are also increasing CAM use (Astin, et al., 2000; Cherniack, et al., 2001; Eisenberg & Davis, 1998; Flaherty, et al., 2001). Among older adults, CAM use is often attributed to multiple health problems including general poor health, and chronic disease (Cherniack, et al., 2001), and particularly to chronic conditions such as cancer, depression, pain, and arthritis (Williamson, et al., 2003).

Importance for Policy and Practice

CAM use by older Americans is of policy and practice interest in part because people may substitute CAM for conventional medicine. It is also of interest because some CAM therapies can have negative interactions with pharmacological therapies that older people use commonly. A number of studies have reported that CAM can interact negatively with conventional medication (Barnes, et al., 2008; Chong, 2008). Combining prescription medication with CAM can often lead to adverse drug interactions (Cheung,

et al., 2007; Tachjian, 2010). Many older adults take multiple prescription medications to control a number of chronic conditions (Dergal, 2002; Tachjian, 2010). Thus, older adults using CAM may have greater risks than others for adverse interactions between CAM and prescription medication (Dergal, 2002). There is also evidence that individuals may often substitute less-costly CAM for conventional medical care, particularly in times of economic challenges (Cuellar & Aycock, 2003).

The new Health Care Bill, H.R. 3590 creates several new programs relevant to CAM (Reddy, 2010). The Bill calls for the President to establish an advisory group that will include integrative health practitioners with patient-centered outcomes as the bottom line of patient care focus (Reddy, 2010). The definition of "integrated health care provider" is still under debate; physicians argue that they alone should hold this title (Reddy, 2010). One of the goals of the Integrated Health Care Policy Consortium (IHPC), a broad coalition of clinicians, is to ensure access to a range of both CAM and conventional medicine (Integrated Healthcare Policy Consortium, 2010). Under this new legislation, licensed CAM providers will be able to get paid for their services via private and public insurance plans (Reddy, 2010). Section 352 of this Bill supports government grants to establish community health teams which can include licensed CAM practitioners, and to coordinate appropriate used of CAM services with conventional care (Patient Protection and Affordable Care Act, 2010).

Given the potential negative interactions of herbal medicine and conventional medicine, researchers recommend that patients inform their health care providers of any herbs they are taking, and that health care providers ask patients about CAM use (Rhee, 2004). Patients often do not inform health providers of use of herbs and dietary

supplements (Dergal, 2002). Patients do not disclose CAM use because they do not think it is important, or are concerned that their health provider might disapprove (Barraco, 2005). Lack of awareness about what constitutes CAM is another reason. Some CAM users may not know that what they are taking or doing is considered CAM. Thus, they do not report CAM use to their health care providers (Chong, 2008). It would be useful for health care policy makers to better understand how increased CAM use is affecting health care delivery. Relatively few studies have examined reasons Americans age 50 and older give for using CAM.

Study Objectives

Disease prevention, and maintaining and promoting health, are key reasons older Americans use CAM. The 2007 National Health Interview Survey (NHIS) collected information about 11 specific reasons people use CAM. This study examines four of the specific reasons for CAM use. They are use of CAM for: general health, general wellness, or general disease prevention (hereafter general health); physical performance; immune function; and energy. This study examines use of CAM for these reasons, focusing on variation associated with ethnicity, gender, and income.

Literature Review

Overview of CAM

CAM includes a wide variety of products, therapies and practices used to promote wellness and to treat illness (WHCCAMP, 2002). CAM and conventional medicine have several characteristics in common, such as an emphasis on whole systems, self-care, self-healing, and the integration of mind-body as part of prevention or healing (WHCCAMP, 2002). Other CAM treatments that are also found in conventional medicine include

elements such as preventative practices and good nutrition (WHCCAMP, 2002). CAM providers tend to focus on the individual, which includes treating the individual as a whole person, including a spiritual element, and promoting self-care (WHCCAMP, 2002). One notable difference between conventional medicine and CAM is that CAM lacks scientific proof of efficacy much more often than conventional medicine (WHCCAMP, 2002).

Nonetheless, there was sufficient evidence that CAM might offer potential benefits that a unit of the National Institutes of Health (NIH), The National Center for CAM (NCCAM), was formed in 1998 to bring scientific rigor to the study of CAM, and to help the public and health professionals understand which CAM therapies have been proven to be safe and effective (NCCAM, 2009a). To focus efforts and use research funds efficiently, it is in the public interest to understand the characteristics of older individuals who use CAM, and their reasons for using it.

CAM Use to Promote General health

A wide range of CAM types are used with the expectation that they will improve general health. Omega-3 fatty acids, exercise, and foliate are all CAM therapies that can benefit general health, generally with little risk (Freeman, 2009). Chiropractic care is often used to improve general health and help adjust the spine and joints (Barnes, et al., 2008). Many Americans take a daily vitamin simply because they believe that it is good for their health (Oakley, 1998). Those who use CAM for general health are likely to combine use of CAM with conventional medicine. These CAM users believe that this combination improves their health and well-being (Eisenberg, et al., 2001; Patterson, et al., 2002).

A number of studies have found evidence that many adults use CAM with the expectation that it will maintain or improve health, or that it will treat health conditions. Responding to the 2002 NHIS and its CAM supplement, a sample representing 54.9% of adults said that CAM improves overall health when combined with conventional medical treatments (Barnes, et al., 2004). In a another study, researchers found that 63% of patients hospitalized with acute coronary disease used at least one CAM therapy for general health (Barraco, 2005). Using data from a survey of 1,597 older residents of California who were enrolled in a Medicare plan that covered acupuncture and chiropractic medicine, researchers found that 14% used acupuncture, 15% used massage, 20% used chiropractic services, and 24% took an herbal supplement to promote general health (Astin, et al., 2000). Using data from a telephone survey of cancer patients from the population-based Cancer Surveillance System of western Washington state (n=356), researchers found that 83% to 97% of patients reported that they used alternative medicine for general health and well-being (Patterson, et al., 2002). In another telephone survey of alternative therapies for cognitive problems among patients in a dementia clinic in Canada, researchers found that 29% reported using alternative medicines to improve general health (Hogan, 1996). In another study of 158 clients of an Australian clinic, researchers found that about half of participants gave general health issues as the reason they visited a complementary health care clinic; 74% of participants said that they use CAM primarily to improve their health (D'Crus, 2005). In a study of people randomly selected from the Minnesota Driver's License registry (n=1200), researchers found that 74% of respondents used CAM to maintain general health (Cheung, et al., 2007). In a cross-sectional survey of residents of Hamilton-Wentworth, Ontario (n=5,416),

researchers found that 37% reported using CAM; the most common reasons given for CAM use were for arthritis, fatigue, and general health (Lewis, 2001).

There is some evidence for the efficacy of CAM. In a recently published study using a randomized controlled trial of patients with fibromyalgia, researchers found that the 33 patients who received a Tai Chi intervention for 12 weeks had significant improvements in mood, quality of life, and general health compared with the patients in the control group (n=33) (C. Wang, Schmid, C.H., Rones, B.S. Kalish, R., 2010). In a review of 77 studies analyzing the results of 66 randomized controlled trials of tai chi and qi gong with 6,410 participants, researchers found evidence that practice of tai chi or qi gong was associated with better bone strength, cardiopulmonary fitness, and quality of life (Jahnke, 2010).

Use of CAM to Promote Immune Function

As people age, there are major changes in hormones that can reduce the effectiveness of the immune system (Cherniack, et al., 2007). Many adults use CAM with the expectation that it will improve their immune system (Matthews, et al., 2007; Mueller, et al., 2008). Popular supplements used with the expectation of stimulating the immune system include beta carotene and Vitamin C (Sierpina, 2005). Ginseng has also been promoted for a purported ability to stimulate the immune system (Sierpina, 2005).

Some research suggests that CAM can enhance immune function, including massage, aromatherapy, and mindful exercise such as Tai Chi, yoga, meditation, or biofeedback (Gaylord, 2002). In one study of 206 patients ages 50 and over with a history of depression and discharged from a psychiatric hospital, participants said that they used megavitamins, yoga, diet and folk remedies to improve their immune system

(Hsu, et al., 2009). In a cross-sectional study of 827 patients treated for cancer who participated in the American Cancer Society's longitudinal Study of Cancer Survivors, researchers found that 573 (69.3%) reported using dietary supplements; 51% of participants said that they used supplements specifically to improve immune system function (Ferrucci, 2009).

Some research suggests that relaxation techniques may help to enhance immune function (Jacobs, 2001; Mamtani, 2002). In a review of studies of CAM use by people with asthma, researchers found evidence that relaxation, meditation and bio-feedback may have positive effects on the immune system (Markham, 2004).

Use of CAM to Improve Physical Performance

CAM used to improve physical performance includes herbal or dietary supplements, and physical manipulation such as massage or yoga. Research indicates that adults use both forms of CAM with the expectation that they may improve physical performance.

Some research suggests that some types of CAM may improve physical performance. In a small study of patients with chronic obstructive pulmonary disease (*n*=29; average age 70), researchers found that a 12-week yoga program improved both exercise performance and self-reported functional performance (Donesky-Cuenco, 2009). In a case-control study, 28 women with osteoarthritis in the knee were randomly assigned to either in an eight week course on *Baduanjin*, a traditional Chinese exercise, or in a control group; compared with the control group, women in the *Baduanjin* group had significant improvements in aerobic ability and improved overall physical function (Bingchen, et al., 2008). *T'ai Chi Chuan* is a form of exercise that is widely practiced by

older adults in Taiwan. In a study conducted with 140 older adults, researchers found that those who regularly practiced *T'ai Chi Chuan* had better physical functioning compared with those in the control group (Tsung-Jung, et al., 2007). In study with 19 women with hyperkyphosis, 58% reported improvement in their physical functioning after participating in (Greendale, et al., 2002).

In a double-blind prospective clinical trial, 20 older adults in good health received cordyceps sinensis, a natural herbal medicine used for centuries in China to preserve health and improve energy, or a placebo for 12 weeks. Those who received cordyceps sinensis had better physical performance, as measured using a stationary bike, than those who received the placebo (Chen, 2010). In a meta-analysis focused on use of supplemental Vitamin D in eight randomized controlled trials (n = 2,426), researchers found that the likelihood of falls among older adults who received Vitamin D supplements was reduced by 19% (Bischoff-Ferrari, 2004).

Use of CAM to Enhance Energy

Lack of energy is a common complaint among older Americans, especially patients recovering from cancer. However, few studies have examined CAM use specifically to improve energy. In a survey of CAM use among 179 Hispanic adults recruited from a hospital in Southern California, 39% reported using alternative medicine with the expectation that it would improve their energy (Mikhail, et al., 2004). As for potential efficacy, in a cross-sectional study of 827 patients who had been treated for cancer and participated in the American Cancer Society's longitudinal Study of Cancer Survivors, researchers found that 573 (69.3%) reported that they used dietary supplements; 44% patients said they used CAM to improve energy (Ferrucci, 2009).

Hypotheses

Research Objectives and Hypotheses

The objective of this study is to examine four reasons for CAM use – for general health, physical performance, immune function, and energy – focusing on differences by ethnicity, gender, and income. The findings will contribute new knowledge regarding older Americans' CAM use. Using a nationally representative survey of Americans conducted in 2007, and focusing on women and men age 50 and over, the research hypothesis are:

1. CAM Use will Differ by Ethnicity.

For each of the four reasons for CAM use, African Americans will be less likely to use a CAM than Whites. Although CAM is not considered to be part of conventional medicine, it is often perceived as medicine. African Americans have a historic distrust of medicine and medical treatments, which may be due in part to the reputation of the Tuskegee syphilis study (Corbie-Smith, et al., 1999; Gamble, 1997; Wallace, et al., 2007; Zekeri & Habtemariam, 2006). The continued distrust of the medical community among African Americans was suggested as recently as 2009, in a survey addressing the relationship between education and conspiracy beliefs surrounding HIV among 205 HIV-positive African Americans; the majority said that the government is withholding both information about AIDS and a cure for AIDS (Zekeri, et al., 2009). The small number of African American physicians exacerbates the distrust of conventional medicine among African Americans (Zekeri & Habtemariam, 2006).

2. Women Will be More Likely than Men to Use CAM.

Women will be more likely than men to use CAM for each of the four reasons. Previous studies have shown that women use CAM more than men (Brown, 2009), and

also that they use medical services more than men (Rohrer, et al., 2008). Women live longer than men; this longer life is often accompanied by more chronic disease or disability (Hayward & Heron, 1999). Women are disproportionally affected by chronic diseases that have a high impact on mobility, independent living, and quality of life, such as arthritis and dementia (Arora, 2008; Hayward & Heron, 1999; S. B. Laditka & Laditka, 2009; Stewart, 1997). When conventional medicine is not effective, older women may turn to CAM (Cuellar & Aycock, 2003). Additionally, American women receive a constant barrage of messages from society that focus on their need to maintain youthful good looks (Holstein, 2001). Physical appearance can be enhanced through surgery, injections, or less invasive methods such as a healthy diet and exercise (Arora, 2008). Thus, many women try to prevent or reduce health problems related to chronic disease, and seek to enhance their appearance, which can be addressed through improving general health, immune function, physical performance or energy.

3. CAM will be Used More by Those with Higher Incomes than by Those with Lower Incomes.

Those who can afford CAM are more likely to feel they have the disposable income needed to improve their health than those with lower incomes. Vitality, energy, improved immunity, and health are strongly promoted to the American public (Brogan, 2009; Rubin, 2004). The cost and popularity of CAM therapies has increased in recent years; the market for herbal therapies alone has become a billion dollar market, estimated at more than $5.1 billion in 1997 (Kaplan, et al., 2007). In some cases, what was once viewed as a home remedy has now become part of the growing market to promote health (Martin, 2000). Having access to a gym or a fitness facility is significantly associated

with the ability to participate in exercise including yoga, tai chi, qi gong, or other forms of what NCCAM calls mind-body therapy; however, the cost of membership may be a barrier for people with less income. Limited access to healthy foods, such as fresh fruits and vegetables, is a challenge in low income urban areas, and in remote areas where groceries are expensive or trucked in from a distance (Alley, et al., 2009). The use of CAM to improve general health, immune function, physical performance, or energy, therefore, may be perceived as something to strive for all income levels, but more often pursued by people with higher incomes.

Design and Methods

Conceptual Framework

Theoretical Model

Details of the theoretical model applied to this research on CAM have been previously reported (Tait, 2010). This study uses the Andersen model of health services use as a framework to guide the research (Andersen, 1973). The Andersen model was developed to study factors that contribute to use of acute care health services (Andersen, 1973). The Andersen model has been extended to CAM use (Brown, 2009; Goldsmith, 2002). It proposes that health services use is determined by three factors: predisposing factors, enabling factors, and need factors (Andersen, 1973). Predisposing factors include demographic and social characteristics. Enabling factors include family and community characteristics. Need includes perceived and actual health needs. The Andersen model provides a useful framework for analyzing motivations for CAM use (Barnes, et al., 2008). The model is shown in Figures 1 and 2.

Dependent Variables

There are four dependent variables in this study, each used in a separate analysis:

1. Used CAM for general wellness, general health, or general disease prevention (referred to as "general health" from here forward);
2. Used CAM to improve immune function;
3. Used CAM to improve physical performance;
4. Used CAM to improve energy.

Each dependent variable is a composite of four to 19 variables based on survey questions (Exhibit 1). Each question focused on the last 12 months, with the exception of questions regarding vitamin and herbal use, for which the questions only asked, "did you" use the given CAM, rather than "in the past 12 months did you" use it. Each variable is coded 0=no, 1=yes.

Covariates

Details of the variable coding have been published (Tait, 2010). All variables were coded dichotomously. Categorical variables were expressed in the model using a dummy variable to indicate each category. Referent groups were selected to represent the most useful comparison (Hardy, 1993). The general guideline used for selecting the referent category was to choose the category with the greatest number of observations. This decision rule was used for the following variables: ethnicity, insurance, age, marital status, education, income, weight, health status, self-reported health, and region. For the income-to-need ratio, the mid-point was judged to provide the most useful comparison. Thus, individuals with higher or lower incomes were compared to those with incomes in the middle of the income-to-need distribution.

Predisposing characteristics were separated into two groups: demographic characteristics and social structure.

Predisposing / demographic characteristics represented in the model included age, sex, and marital status (Bradley, et al., 2002; J. N. Laditka, 2003). For sex, men are the referent group. Age was coded into 5-year age ranges, consistent with other studies that analyze differences in CAM use by age cohorts. This categorization limits the possibility of residual confounding while permitting the identification of any notable non-linearities in the results. The referent category for age is 50 to 55. Marital status was divided into four categories: never married; married; separated, divorced, or widowed; and marital status unknown. The referent category for marital status is married. Use of these variables is consistent with other studies (Andersen, 1973; J. N. Laditka, 2003).

Predisposing / social structure characteristics represented in the model include education and ethnicity. Education is divided into seven groups based on years of education completed: grade 8 or less; grades 9 to 12; high school diploma; associate degree; bachelor's degree; MS, MD, or PhD; and education missing. The referent category is completion of high school. Ethnicity is characterized by five groups: Hispanic, Asian, non-Hispanic African American (hereafter referred to as African American), non-Hispanic White (hereafter referred to as White), and "other." White is the referent category. The relatively few individuals who reported both Asian and Hispanic ethnicity were categorized as Hispanic.

Enabling factors encompass such elements as community and family. Community is represented in these data by region of the country. Enabling characteristics measured at the level of families include income level and health insurance (Andersen, 1973; Bradley, et al., 2002; J. N. Laditka, 2003).

Enabling / Family. The family indicator of income level is the income-to-need ratio. Variables representing a variety of income-to-need levels are included in the logistic regression models to control for differences in family income. Following a standard definition used in economic analyses, the income-to-need ratio is calculated using household size, total household income, and household makeup (such as the number of children and older adults, where both groups are presumed to consume fewer resources), and adjusted for annual cost of living using federal poverty guidelines (U. S. Census Bureau, 2009). Individuals with an income-to-need ratio of 1 have exactly the income that defines the federal poverty threshold for someone in similar family circumstances. Those with an income-to-need ratio of 2 have twice that level of income. The income-to-need ratio is divided into five groups: < 1, 1 to <2, 2 to <3, 3 to <4, 4 to <5, and 5+, with <1 being the poorest and 5+ being the wealthiest. The referent category for income-to-need is 3 to <4.

Health insurance is grouped into seven categories: dual eligibility for individuals enrolled in Medicaid and Medicare; Medicaid only; Medicare only; Medicare Plus, which identifies Medicare beneficiaries who also have supplemental medical insurance; other public health insurance; private health insurance; and uninsured. Private health insurance is the referent category. The presence or absence of health insurance and the quality/type of health insurance is associated with health status, an effect that crosses all sociodemographic borders (Franks, et al., 1993).

Enabling / Community Characteristics. The only community factor with a measured variable in this study is region of the country (Wennberg, et al., 2002). Region has been found to be a contributing factor in Medicare costs and service use (Wennberg,

et al., 2002). Identified regions are: Northeast, Midwest, West, and South. The South is the referent category.

Need is comprised of an individual's health and functional capacity, both as perceived by the individual and as evaluated by medical practitioners (Bradley, et al., 2002; J. N. Laditka, 2003). Perceived need includes the individual's perception and self-report of her or his health status at the time of the survey, compared with her or his recollection of health status a year before the survey. It also includes self-reports of current health status. Evaluated need requires professional judgment and objective measurements; the NHIS provides proxy measures of evaluated health need, which result from asking participants if a doctor or other health professional has told them that they have diabetes, hypertension, and a variety of other medical conditions (Bradley, et al., 2002).

Need / Perceived Good Health is represented by self reported health status. Self reported health is an indication of how the person feels about her or his health currently. This variable has two categories: 1) excellent, very good, or good health, and 2) fair or poor health. The first of these was the referent category. Health status compares a person's health on the day of interview with her or his recollected overall health one year earlier. It is divided into four categories: better, same, worse, or missing, with "same" as the referent category.

Need / Evaluated Health factors include both chronic conditions and health risks. Health risks include: current smoker and weight categories. Weight was categorized into four groups using body mass index (BMI) cut points established by the Centers for Disease Control and Prevention (CDC): underweight, normal weight, overweight, and

obese. An additional dummy variable represents individuals with missing BMI information. Normal weight is the referent category.

Eight chronic conditions were included: musculoskeletal, endocrine and metabolic, circulatory, depression, weight problems, cancer, nervous, and problems with memory or cognition. Each of these conditions was coded based on responses to a set of survey questions relating to the given condition. For example, an individual was considered to have depression if she or he reported that depression caused difficulty with activities, or depression caused any limitation, or that she or he had ever been told by a doctor that she or he had depression. Table 1 shows a summary of the coding for the eight chronic conditions.

The National Health Interview Survey (NHIS)

The National Health Interview Survey (NHIS) is a nationally representative survey conducted annually in the U.S since 1963. Details of the NHIS have been published (NHIS, 2009). It is a cross-sectional, multistage household survey (NHIS, 2009). This survey collects information about use of medical services, health status, and other health measures.

The NHIS questionnaire is made up of core questions, a basic set of questions regarding health, and demographic items. Each year there are three additional components: 1) a Household component, which collects limited demographic information on all individuals living in the household; 2) a Family component, which verifies and collects additional information about the access and utilization of health care, health limitations, injuries, health status, insurance, income, and assets; and 3) Sample Adult and Sample Child components. The Sample Adult and Sample Child surveys are asked

of one participant randomly selected from each household that participates in the NHIS (NHIS, 2009).

Each year, supplemental questionnaires are included in the survey. These supplements may be included on a one time basis, or asked on a rotating basis. The Complementary and Alternative Health supplement was conducted in 2002 and 2007, with a small pilot questionnaire included in the 1997 survey (NHIS, 2009).

This study uses three components from the 2007 National Health Interview Survey. These are the Family component, the Sample Adult component, and the Complementary and Alternative Health component (NHIS, 2009). A total of 23,393 adults age 18 and over responded to the CAM supplement; the response rate was 68.7% of those who responded to the Adult questionnaire (Barnes et al., 2008). The Complementary and Alternative Health component contains over 3,000 variables describing the use, use frequency, and intended purpose for use of 36 specific types of CAM (NHIS, 2009).

Ethical Considerations

All data are de-identified and freely available at the website of the National Center for Health Statistics. This study was approved by the Institutional Review Board at the University of North Carolina at Charlotte.

Statistical Analysis

Analyses included descriptive, bivariate, and multiple logistic regression. All analyses were weighted for national representation of population characteristics including ethnicity, gender, income, education, specific age groupings, and other characteristics (NHIS, 2009). Data analysis was conducted using SAS 9.1 (Cary, NC), and accounted for the complex survey design. Four logistic regression models were estimated, one for

each of the four reasons for CAM use. Each model controlled for the exposure and control variables. Variables were assessed for multicollinearity. There was no evidence that multicollinearity was sufficiently great to affect the results meaningfully.

Results

Table 2 shows the percentage of the sample reporting each of the reasons for CAM use. Of older adults who reported using CAM, 57.93% did so with the expectation of improving general health; 24.08% to improve immune function; 17.78% to improve physical performance; and 11.26% to improve energy. Cross-tabulation results not shown in the table suggested that most individuals gave only one of these four reasons for using CAM.

Characteristics of the Sample

The weighted descriptive, nationally representative results appear in Tables 3 and 4. Those who are age 50 and older have a sample size of 10,096, representing about 89.5 million older people. Table 3 shows information representing all Americans ages 50 and older in the data columns at the left, information representing those who used CAM for general health in the middle data columns, and information representing those who used CAM to improve immune function in the data columns at the right. For all three groups, results are shown for the exposure and control variables. Table 4 shows information representing all Americans ages 50 and older in the data columns at the left, information representing those who used CAM to improve physical performance in the middle data, and information representing those who used CAM to improve energy in the data columns at the right. All tables show the sample size (n), the weighted population size (N/1000), the weighted percent for each category, and the confidence interval for the

percent estimate.

General Health

Those who use CAM for general health had a sample size of 5,766, representing about 51.9 million older people. Women were 53.8% of the total population, and 58.1% of those who used CAM for general health. These unadjusted results suggest that women were somewhat more likely than men to use CAM to improve their general health. African Americans were 9.8% of the general population, and 7.7% of those who used CAM for general health. Those with an income-to-need ratio of 5+ were 32.4% of the general population, and 37.7% of those who used CAM for general health. These unadjusted results suggest that those with an income-to-need 5+ were more likely than those with an income-to-need of 3 to <4 to use CAM to improve general health.

Immune Function

Those aged 50 and older who used a CAM with the expectation of improving their immune function had a sample size of 2,425, representing about 21.6 million older people. Women were 53.8% of the total population, and 59.9% of those who used CAM to improve immune function. These unadjusted results suggest that women were more likely than men to have used CAM to improve their immune function. African Americans were 9.8% of the total population, and 7.4% of those who used CAM to improve immune function. Those with an income-to-need ratio of 5+ were 32.4% of the population, and 37.0% of those who used CAM to improve immune function. These unadjusted results suggest that those with an income-to-need ratio of 5+ were more likely than those with an income-to-need ratio of 3 to <4 to have used a CAM to improve their immune function.

Physical Performance

Those aged 50 and older who used a CAM to improve their physical performance had a sample size of 1,768, representing about 15.9 million older people. Women were 53.8% of the population but 61.6% of those who used CAM to improve physical performance. These unadjusted results suggest that women were considerably more likely than men to have used CAM to improve their physical performance. African Americans were 9.8% of the population, and 6.7% of those who used CAM to improve physical performance. These unadjusted results suggest that African Americans were considerably less likely than Whites to have used CAM to improve physical performance. Those with an income-to-need ratio of 5+ were 32.4% of the population; 36.6% used CAM to improve physical performance. These unadjusted results suggest that those with an income-to-need ratio of 5+ were more likely than those with an income-to-need ratio of 3 to <4 to have used a CAM to improve their physical performance. Those with a musculoskeletal condition were 49.2% of the population but 60.1% of those who used CAM to improve physical performance, suggesting that those with such conditions use CAM considerably more commonly than those without such conditions.

Energy

Those aged 50 and older who used a CAM to improve their energy had a sample size of 1,095, representing about 10.09 million older people. Women were 53.8% of the population but 66.9% of those who used CAM to improve energy. These unadjusted results suggest that women were considerably more likely than men to have used CAM to improve their energy. African Americans were 9.8% of the population but 6.2% of those who used CAM to improve energy. These unadjusted results suggest that African

Americans were less likely than Whites to use CAM to improve energy. Those with an income-to-need ratio of 5+ were 32.4% of the population but 46.3% of those who used CAM to improve energy. These unadjusted results suggest that those with an income-to-need ratio of 5+ were more likely than those with income-to-need ratio of 3 to <4 to use a CAM to improve energy.

Unadjusted Results

Results of unadjusted logistic analyses of the likelihood of using a CAM for the four reasons for the groups of interest are shown in Table 5. For each result, Table 5 shows the odds ratio (OR) and upper and lower bounds of the 95% confidence interval (CI), and a symbol representing the level of the p-value.

For CAM use for general health, the odds for women were 51% greater than the corresponding odds for men (OR 1.51, CI 1.38-1.65). The odds for African Americans were 46% lower than those for Whites (OR 0.54, CI 0.46-0.62). Those with lower incomes were less likely to use CAM than those with middle incomes. The odds that an older adult with an income-to-need ratio of 5+ would use a CAM for general health were 40% higher than the odds for those with an income-to-need ratio of 3 to <4 (OR 1.40, CI 1.21-1.61).

For CAM use for immune function, the odds for women were 39% greater than the corresponding odds for men (OR 1.39, CI 1.24-1.56). The odds for African Americans were 34% lower than those for Whites (OR 0.66, CI 0.55-0.80). Those with lower incomes were less likely to use CAM to improve immune function than those with middle incomes.

For CAM use for physical function, the odds for women were 47% greater than the corresponding odds for men (OR 1.47, CI 1.30-1.66). The odds for African Americans were 40% lower than those for Whites (OR 0.60, CI 0.49-0.74). Those with lower incomes were less likely to use CAM than those with middle incomes.

For CAM use for improved energy, the odds for women were 86% greater than the corresponding odds for men (OR 1.86, CI 1.59-2.18). The odds for African Americans were 43% lower than those for Whites (OR 0.57, CI 0.43-0.75). Older adults with higher incomes were more likely to use CAM for energy than those with middle incomes.

Adjusted Results

Adjusted results are reported in Table 6, which shows the OR, the 95% CI, and the p-value associated with each result.

General health

The adjusted odds that a woman would use CAM to improve general health were 71% higher than the corresponding odds for men (OR 1.71, CI 1.54-1.90). The adjusted odds that an African American would use CAM to improve general health were 25% lower than the corresponding odds for Whites (OR 0.75, CI 0.63-0.89). There was some evidence of a gradient effect for income. Those with less income were less likely to use CAM; those more income were more likely to do so. There was also evidence of a gradient effect for education: those with less education were less likely to use CAM to improve general health; those with more education were more likely to do so. The adjusted odds of using CAM to improve general health for those who are uninsured were 29% lower than the corresponding odds for those with private insurance (OR 0.71, CI 0.58-0.88). The adjusted odds that those who are obese would use a CAM to improve

general health were 20% lower than the odds for those of normal weight (OR 0.80, CI 0.68-0.93). The adjusted odds of using a CAM to improve general health were 57% higher for those with a musculoskeletal condition (OR 1.57, CI 1.40-1.75), and 30% higher for those with cancer (OR 1.30, CI 1.12-1.51).

Immune Function

The adjusted odds that a woman would use CAM to improve immune function were 41% higher than the corresponding odds for men (OR 1.41, CI 1.24-1.60). The adjusted odds that an African American would use CAM to improve immune function were 19% lower than the corresponding odds for Whites (OR 0.81, CI 0.66-0.99). The adjusted odds that those with an income-to-need ratio ≤1 would use CAM to improve immune function were 33% lower than the corresponding odds for those with an income-to-need ratio of 3 to <4 (OR 0.67, CI 0.52-0.85). There was evidence of a gradient effect for education: older adults with less education were less likely to use CAM to improve immune function; those with more education were more likely to do so. The adjusted odds that those who have Medicare Plus would use CAM to improve immune function were 39% higher than the corresponding odds for those with private insurance (OR 1.39, CI 1.10-1.76). Compared to those with normal weight, those who are overweight had 36% lower odds of using CAM (OR 0.86, CI 0.75-0.99); the odds were 24% lower for those who were obese (OR 0.76, CI 0.65-0.89). Compared with older adults without these chronic conditions, the adjusted odds that those with musculoskeletal conditions would use CAM to improve immune function were 40% higher (OR 1.40, CI 1.25-1.58); for depression, the odds were 69% higher (OR 1.69, CI 1.20-2.38); for cancer, the odds were 31% higher (OR 1.31, CI 1.12-1.52).

Physical Performance

The adjusted odds that a woman would use CAM to improve physical performance were 49% higher than the corresponding odds for men (OR 1.49, CI 1.30-1.69). The adjusted odds that an African American would use CAM to improve physical performance were 22% lower than the corresponding odds for Whites (OR 0.78, CI 0.62-0.98). The adjusted odds that those with an income-to-need ratio ≤1 would use a CAM to improve physical performance were 36% lower than the corresponding odds for those with an income-to-need ratio of 3 to <4 (OR 0.64, CI 0.48-0.85). There was some evidence of a gradient effect for education: older adults with less education were less likely to use CAM to improve physical health; those with more education were more likely to do so. The adjusted odds that those who are obese would use CAM to improve physical performance were 22% lower than the corresponding odds for those of normal weight (OR 0.78, CI 0.66-0.92). The adjusted odds that those with musculoskeletal conditions would use CAM to improve physical performance were 76% higher than the odds for those without these conditions (OR 1.76, CI 1.53-2.03); depression increased the odds by 97% (OR 1.97, CI 1.40-2.78); cancer increased the odds by 23% (OR 1.23, CI 1.05-1.44).

Energy

The adjusted odds that a woman would use CAM to improve energy were 2.03 higher than the corresponding odds for men (OR 2.03, CI 1.69-2.45). The adjusted odds that an African American would use CAM to improve energy were 31% lower than the corresponding odds for Whites (OR 0.69, CI 0.51-0.94). There was evidence of a gradient effect for education: older adults with less education were less likely to use

CAM to improve energy; those with more education were more likely to do so. Compared to those with normal weight, for those who are obese the odds were 28% lower (OR 0.72, CI 0.59-0.87). The adjusted odds that those with musculoskeletal conditions would use CAM to improve energy were 49% higher than the odds for those without these conditions (OR 1.49, CI 1.26-1.75); having depression increased the odds by 97% (OR 1.97, CI 1.24-3.14).

Discussion

Americans are well known for their love affair with looking and feeling young. Regardless of this desire for eternal youth, aging cannot be stopped. As America ages, the increasing proportion of older Americans is likely to increase the ranks of those who seek to improve their quality of life through CAM use (Williamson, et al., 2003). Using data that represents Americans age 50 and over, this study examined four reasons for the use of CAM, for general health, immune function, physical performance, and energy. The analysis focused on differences associated with gender, ethnicity and income.

Three hypotheses guided this research. The first hypothesis was that African Americans would be less likely than Whites to use CAM for the four physical health reasons. The results provide strong evidence to support this hypothesis, and are consistent with previous research (Corbie-Smith, et al., 1999; Gamble, 1997; Wallace, et al., 2007; Zekeri & Habtemariam, 2006). The second hypothesis was that women would be more likely than men to use CAM for the four reasons. The results support this hypothesis, and are consistent with previous research (Astin, 1998; Barraco, 2005; Brems, et al., 2006; Mueller, et al., 2008). The final hypothesis was that those with higher incomes would be more likely to use CAM for the four reasons than those with

middle or lower incomes. The results support this hypothesis, particularly with regard to improving energy, and are consistent with previous research (Fabbri & Monfardini, 2009).

There was also strong evidence of a gradient effect for education, with older adults with more education more likely to use CAM for the four reasons than those with less education. Older adults without insurance were less likely to use CAM to improve general health, whereas those with Medicare plus additional health insurance were more likely to use CAM to improve immune function. Older adults who reported a weight problem were much more likely to use CAM for health and well-being, particularly to improve physical performance or immune function, whereas older adults who were underweight, overweight, or obese were less likely to use CAM for health and well-being. Those with a musculoskeletal condition were more likely to us CAM for all four reasons; those with depression were more likely to use CAM to improve energy, physical and immune function; those with cancer were more likely to use CAM to improve general health, immune function and physical performance.

This study has several strengths, which have been described previously (Tait, 2010). A major strength is the sample size, and the fact that the study was based on a random nationally representative sample of the U.S. population, allowing estimation of results for a variety of subgroups for four reasons for CAM use for general health and well-being. The large sample size allowed examination of the association between CAM use in this population and self-reported health characteristics, such as health behaviors, education, chronic health conditions, income, and health insurance coverage. The data also provided a useful set of measured variables to represent the theoretical elements in

the Andersen model, and provided a reasonable set of controls for potential confounding (Brown, 2009).

It is important to recognize that the data did not allow us to examine the efficacy of CAM use. There are several limitations. The data are cross sectional. Typically cross-sectional analyses do not provide a basis for inferring causality. In the present analysis, however, respondents identified the reasons they used CAM. Although inferences about causality in this instance depend on individuals' accurate assessments of their own motivations, in general it seems reasonable to judge that most respondents believed they used CAM for the reasons they provided. Data were self reported in structured interviews. The validity of the data depends on participants' memory and willingness to accurately report. No validation study was conducted on the data after they were collected. Recall error is a possibility; however, limiting the recall to information about the "past year," compared to asking if the individual had "ever" used CAM, is likely to limit this potential source of bias.

About 30% of participants in the NHIS declined to participate in the supplemental CAM survey. We acknowledge this participation rate as a potential source of bias. CAM users may have been more motivated than non-users to discuss CAM, and more likely to participate. Thus, although the specific CAM supplement was separately weighted for national representativeness, the use of CAM among supplement participants may over-estimate CAM use in the general population. Similarly, results for the attribution of CAM use to the four reasons studied in this analysis might have been different if all NHIS respondents had participated in the CAM survey.

Implications for Policy, Practice, and Research

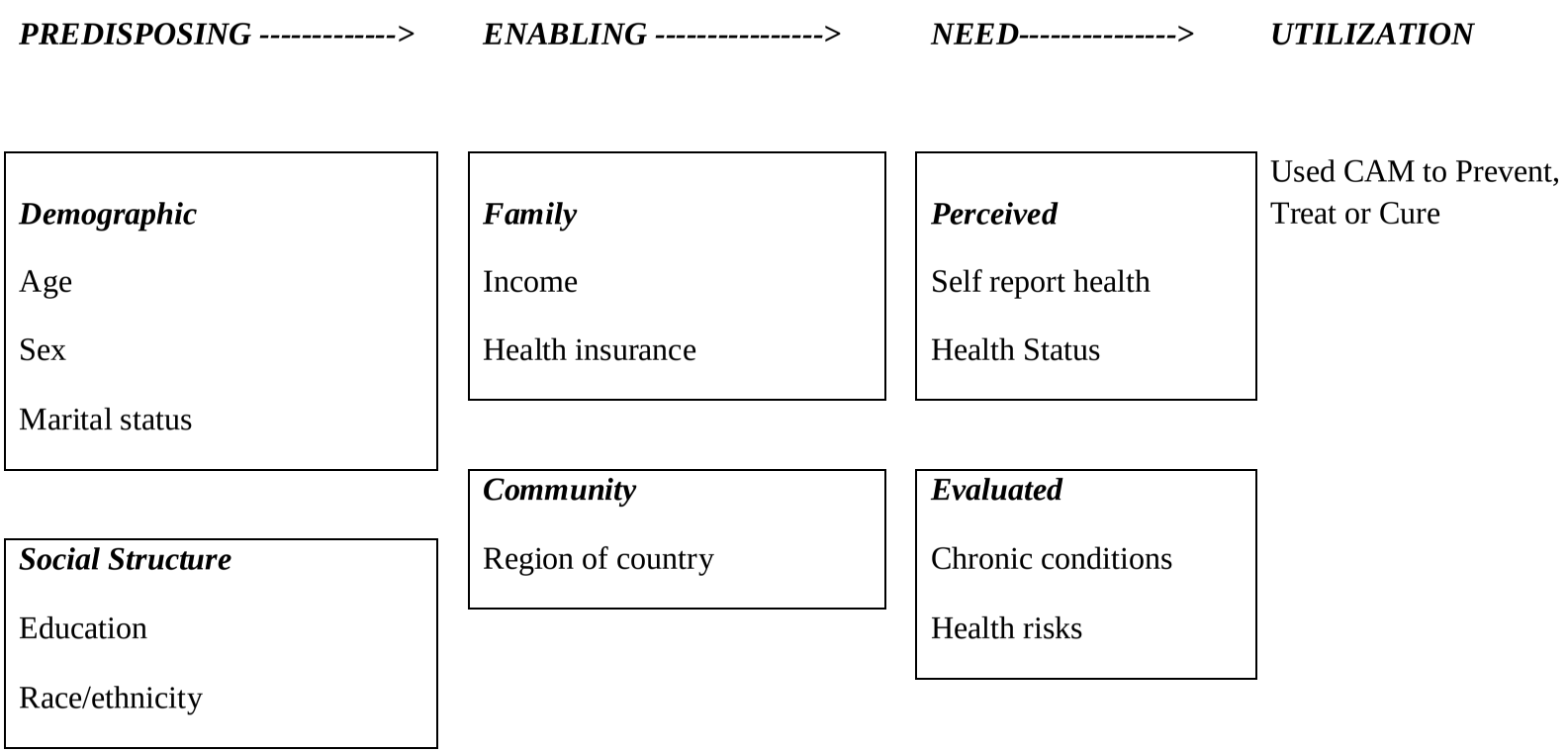
There is considerable variation in the use of CAM to promote general health and well-being, with African Americans less likely to do so than Whites, women more likely than men, and people with higher incomes more likely than those with lower incomes to do so for general health, and particularly to improve energy. Older Americans with chronic diseases such as depression, cancer, or musculoskeletal conditions use CAM more commonly for the four reasons studied than do others. More education was also associated with a higher likelihood of using CAM.

In response to the new health care reform bill, The Patient Protection and Affordable Care Act, health care will increasingly be provided by interdisciplinary teams of health care providers including licensed complementary and alternative medicine practitioners (Patient Protection and Affordable Care Act, 2010). Coordination of care services, including CAM, will be provided for those who request it (Patient Protection and Affordable Care Act, 2010), making CAM that much more accessible to older Americans.

Findings indicate that African Americans are less likely to use CAM than Whites for all of the four reasons. It may be useful for health care providers to consider this result when communicating with older African Americans patients. It would be helpful for providers to discuss possible advantages and disadvantages of CAM use, and the need for patients to discuss CAM use with providers, so that providers can coordinate CAM use with other care. Women were more likely to use CAM than men. Thus, it is particularly useful for providers to discuss CAM use with older women, to minimize or avoid adverse drug-CAM interactions. The results indicate that older adults with less income, those with less education, and men are less likely to use CAM for health and

well-being. Thus, providers may want to discuss the advantages of CAM use, such as Vitamin D supplements, with older adults in these groups.

Figure 5.1: Conceptual Model: from Andersen & Newman (Andersen, 1973)



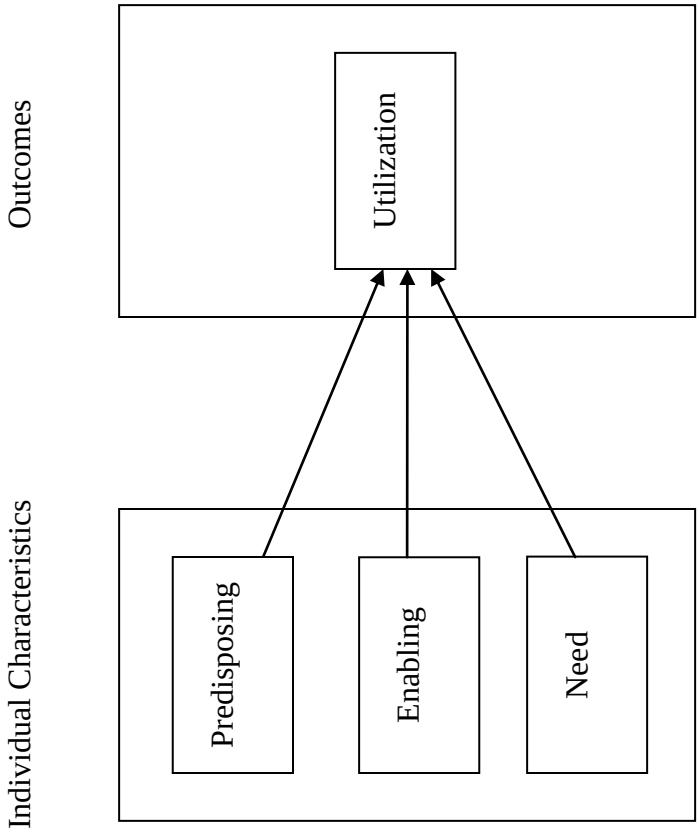


Figure 5.2: Graphical representation of Conceptual Model: from Andersen & Newman (Andersen, 1973)

Table 5.1: NHIS Measures Used to Identify the Presence of Chronic Conditions[a]

Condition	*NHIS Questions / Variables Used to Identify the Presence of the Condition*
Cancer	1. cancer causes difficulty with activity; 2. ever told by a doctor you had cancer; 3. cancer causes limitation?
Circulatory	1. ever been told you had a heart attack; 2. ever been told you had a heart condition/disease; 3. ever been told you had coronary heart disease; 4. had a heart attack, past 12 months; 5. had coronary heart disease, past 12 months; 6. had other heart condition, past 12 months; 7. heart problem causes difficulty with activity; 8. heart problem causes limitation; 9. ever been told you have hypertension; 10. had hypertension, past 12 months; 11. hypertension causes difficulty with activity; 12. hypertension causes limitation; 13. lung/breathing problem causes difficulty with activity; 14. lung/breathing problem causes limitation.
Depression	1. depression/anxiety/emotional problem causes difficulty with activity; 2. depression/anxiety/emotional problem causes limitation.
Endocrine, Nutrition, Metabolic	1. endocrine/nutritional/metabolic problem causes difficulty with activity; 2. endocrine/nutritional/metabolic problem causes limitation; 3. ever been told that you have diabetes; 4. diabetes causes difficulty with activity; 5. Diabetes causes limitation.
Memory / Cognition problems	1. Senility/dementia/Alzheimer's causes difficulty with activity 2. Had memory loss in the past 12 months 3. Is activity limited by difficulty remembering? 4. Senility causes limitation

Table 5.1 (continued)

	16 Ever been told you had dementia?
Musculoskeletal	1. musculoskeletal/connective tissue problem causes difficulty with activity; 2. arthritis/rheumatism causes difficulty with activity; 3. back/neck problem causes difficulty with activity; 4. fracture/bone/joint injury causes difficulty with activity; 5. ever been told you had arthritis; 6. ever told you had other joint condition; 7. musculoskeletal/connective tissue problem causes limitation; 8. arthritis/rheumatism causes limitation; 9. back/neck problem causes limitation; 10. fracture/bone/joint injury causes limitation.
Nervous, Sensory	1. nervous system/sensory organ condition causes difficulty with activity; 2. nervous system/sensory organ condition causes limitation; 3. vision problem causes difficulty with activity; 4. vision problem causes limitation; 5. hearing problem causes limitation; 6. hearing problem causes difficulty with activity; 7. ever been told you had a stroke; 8. had stroke, past 12 months; 9. stroke causes difficulty with activity; 10. stroke causes limitation.
Weight problems	1. weight problem causes limitation; 2. weight problem causes difficulty with activity.

[a]Data source: 2007 National Health Interview Survey.

Table 5.2: Frequencies for four reasons for using CAM for health and well-being provided by women and men age 50 and older[a]

	n	N	%	95% CI for %
Improve General health	5766	51,888,166	57.93	56.58, 59.29
Improve Immune Function	2425	21,567,587	24.08	22.93, 25.23
Improve Physical Performance	1768	15,928,442	17.78	16.73, 18.84
Improve Energy	1095	10,088,156	11.26	10.21, 12.32

[a]Data source: National Health Interview Survey (NHIS) 2007; CAM=complementary and alternative medicine.

Table 5.3: Characteristics of Women and Men Ages 50 And Older Who Used A CAM for Health and Well-Being in the Last 12 Months, 2007 National Health Interview Survey[a]

	Age 50 and Older				Age 50 and Older Who Use a CAM for General Health				Age 50 and Older Who Use a CAM for Immune Function			
	n = 10,096				n = 5,766				n = 2,425			
	n	N / 1,000	%	CI	n	N / 1,000	%	CI	n	N / 1,000	%	CI
Gender												
Women	5734	48,201	53.8	52.7, 55.0	3525	30,154	58.1	56.6, 59.6	1509	12,928	59.9	57.5, 62.4
Men	4362	41,363	46.2	45.0, 47.3	2241	21,734	41.9	40.4, 43.4	916	8,640	40.1	37.6, 42.5
Race/Ethnicity												
Asian	398	3,321	3.7	3.2, 4.2	245	1,958	3.8	3.2, 4.4	111	842	3.9	2.9, 4.9
African Americans	1467	8,757	9.8	9.0, 10.5	671	3,998	7.7	6.9, 8.5	269	1,606	7.4	6.3, 8.6
Hispanic	1135	7,236	8.1	7.3, 8.9	499	3,096	6.0	5.2, 6.8	202	1,322	6.1	5.0, 7.3
White	7011	69,479	77.6	76.4, 78.8	4306	42,440	81.8	80.5, 83.1	1820	17,578	81.5	79.6, 83.4
Other	85	770	0.9	0.5, 1.2	45	396	0.8	0.5, 1.1	23	220	1.0	0.5, 1.5
Income to Poverty Ratio												
less than 1	1260	7,888	8.8	8.1, 9.5	552	3,415	6.6	5.9, 7.3	223	1,343	6.2	5.3, 7.2
1 to less than 2	2070	16,016	17.9	17.0, 18.8	1005	7,775	15.0	13.8, 16.1	407	3,208	14.9	13.2, 16.6
2 to less than 3	1787	15,711	17.5	16.7, 18.4	1008	8,699	16.8	15.6, 17.9	431	3,704	17.2	15.5, 18.8
3 to less than 4	1222	11,036	12.3	11.6, 13.1	733	6,479	12.5	11.5, 13.5	318	2,782	12.9	11.4, 14.4
4 to less than 5	1026	9,877	11.0	10.3, 11.8	622	5,956	11.5	10.6, 12.4	276	2,542	11.8	10.4, 13.1
5 and over	2731	29,035	32.4	31.1, 33.8	1846	19,564	37.7	36.0, 39.4	770	7,988	37.0	34.7, 39.4
50 to 54	2109	20,841	23.3	22.2, 24.4	1183	11,734	22.6	21.2, 24.0	573	5,607	26.0	24.1, 27.9
55 to 59	1790	17,135	19.1	18.1, 20.2	1054	10,247	19.7	18.5, 21.0	461	4,226	19.6	17.8, 21.4
60 to 64	1617	15,458	17.3	16.3, 18.2	953	9,295	17.9	16.8, 19.1	411	3,983	18.5	16.6, 20.3

Table 5.3 (continued)

65 to 69	1369	11,074	12.4	11.6, 13.1	767	6,219	12.0	11.0, 13.0	328	2,557	11.9	10.4, 13.3
70 to 75	1047	8,172	9.1	8.5, 9.8	589	4,781	9.2	8.3, 10.1	204	1,665	7.7	6.5, 8.9
75 to 79	903	7,361	8.2	7.6, 8.8	528	4,366	8.4	7.6, 9.2	219	1,834	8.5	7.3, 9.7
80 to 84	718	5,508	6.1	5.6, 6.7	411	3,099	6.0	5.3, 6.7	142	1,083	5.0	4.1, 5.9
85+	543	4,014	4.5	4.0, 4.9	281	2,146	4.1	3.6, 4.7	87	614	2.8	2.2, 3.5
Insurance Status												
Uninsured	901	7,902	8.8	8.2, 9.5	398	3,392	6.5	5.8, 7.3	187	1,662	7.7	6.5, 8.9
Dual eligible	464	2,866	3.2	2.8, 3.6	200	1,268	2.4	2.0, 2.9	85	516	2.4	1.8, 3.0
Medicaid only	306	1,948	2.2	1.8, 2.5	116	749	1.4	1.1, 1.8	58	424	2.0	1.3, 2.7
Medicare only	1473	10,978	12.3	11.5, 13.0	772	5,837	11.2	10.2, 12.3	304	2,137	9.9	8.6, 11.2
Medicare Plus	2417	20,706	23.1	22.0, 24.2	1498	12,770	24.6	23.1, 26.1	583	5,141	23.8	21.7, 25.9
Other Public Health Insurance	353	3,159	3.5	3.1, 4.0	195	1,735	3.3	2.8, 3.9	89	729	3.4	2.6, 4.1
Private Insurance	4182	42,003	46.9	45.5, 48.3	2587	26,138	50.4	48.6, 52.2	1119	10,959	50.8	48.3, 53.4
Marital Status												
Never married	807	5,308	5.9	5.4, 6.5	407	2,681	5.2	4.5, 5.8	186	1,211	5.6	4.7, 6.5
Married	4904	56,673	63.3	62.1, 64.4	2918	33,837	65.2	63.7, 66.7	1171	13,453	62.4	60.1, 64.7
Separated, Divorced, Widowed	4324	27,213	30.4	29.3, 31.4	2411	15,179	29.3	27.8, 30.7	1052	6,818	31.6	29.5, 33.7
Marital Status Unknown	61	370	0.4	0.3, 0.5	30	191	0.4	0.2, 0.5	16	85	0.4	0.2, 0.6
Education Levels												
≤ 8	975	6,970	7.8	7.1, 8.4	375	2,738	5.3	4.6, 6.0	127	897	4.2	3.3, 5.1
8 – 12	1078	8,586	9.6	8.9, 10.3	460	3,772	7.3	6.4, 8.1	185	1,587	7.4	6.1, 8.6
High school Diploma	4689	42,140	47.0	45.8, 48.3	2690	24,191	46.6	44.9, 48.3	1099	9,658	44.8	42.4, 47.2
Associate's Degree	841	7,701	8.6	8.0, 9.2	550	5,050	9.7	8.8, 10.7	266	2,411	11.2	9.7, 12.6
Bachelor's Degree	1454	13,928	15.6	14.6, 16.5	1002	9,570	18.4	17.2, 19.7	445	4,122	19.1	17.3, 20.9
Master's, PhD, MD	948	9,348	10.4	9.6, 11.3	656	6,322	12.2	11.1, 13.3	293	2,823	13.1	11.4, 14.8
Education missing	111	891	1.0	0.8, 1.2	33	245	0.5	0.3, 0.6	10	70	0.3	0.1, 0.5

Table 5.3 (continued)

Health Risks												
Smoking	1526	13,134	14.7	13.7, 15.6	798	6,947	13.4	12.1, 14.7	344	3,116	14.4	12.7, 16.2
Underweight	165	1,390	1.6	1.2, 1.9	84	635	1.2	0.9, 1.5	32	202	0.9	0.6, 1.3
Normal weight	3120	27,311	30.5	29.5, 31.5	1940	17,011	32.8	31.4, 34.2	852	7,426	34.4	32.3, 36.6
Overweight	3630	32,875	36.7	35.5, 38.0	2110	19,609	37.8	36.1, 39.5	861	7,914	36.7	34.3, 39.1
Obese	2614	23,090	25.8	24.7, 26.9	1430	12,912	24.9	23.5, 26.2	603	5,435	25.2	23.1, 27.3
BMI Missing	567	4,898	5.5	4.9, 6.0	202	1,722	3.3	2.8, 3.9	77	590	2.7	2.1, 3.4
Health Status												
Health better	1536	13,773	15.4	14.53, 16.22	990	8,979	17.3	16.2, 18.4	470	4,272	19.8	18.0, 21.6
Health the same	7308	65,294	72.9	71.81, 74.00	4157	37,484	72.2	71.0, 73.5	1672	14,864	68.9	67.0, 70.8
Health worse	1156	9,770	10.9	10.17, 11.65	609	5,341	10.3	9.4, 11.2	282	2,422	11.2	9.8, 12.7
Health missed	96	726	0.8	0.63, 0.99	10	83	0.2	0.1, 0.3	1	9		0.0, 0.1
Self reported health												
Excellent/very good/good health	7755	70,114	78.3	77.28, 79.29	4630	42,294	81.5	80.4, 82.6	1938	17,470	81.0	79.3, 82.7
Fair/poor health	2341	19,450	21.7	20.71, 22.72	1136	9,594	18.5	17.4, 19.6	487	4,097	19.0	17.3, 20.7
Chronic conditions												,
Musculoskeletal	5060	44,025	49.2	47.96, 50.35	3052	27,371	52.8	51.3, 54.2	1332	11,749	54.5	52.2, 56.7
Endocrine, Nutrition, Metabolic	1695	13,917	15.5	14.68, 16.39	838	7,031	13.6	12.4, 14.7	345	3,009	14.0	12.3, 15.6
Circulatory	5750	49,346	55.1	53.92, 56.27	3285	28,626	55.2	53.6, 56.8	1353	11,714	54.3	51.5, 57.2
Depression	401	3,132	3.5	3.07, 3.92	226	1,798	3.5	2.9, 4.1	132	1,107	5.1	3.9, 6.3
Weight problems	265	2,291	2.6	2.24, 2.88	159	1,381	2.7	2.2, 3.1	89	799	3.7	2.9, 4.6
Cancer	1462	13,006	14.5	13.67, 15.37	939	8,414	16.2	15.1, 17.3	420	3,688	17.1	15.6, 18.7
Nervous, Sensory	1180	10,064	11.2	10.43, 12.04	619	5,476	10.6	9.5, 11.6	270	2,332	10.8	9.3, 12.4
Memory / Cognition problems	1121	9,042	10.1	9.41, 10.78	596	4,879	9.4	8.6, 10.2	268	2,124	9.8	8.5, 11.2
Region												
Northeast	1774	15,933	17.8	16.55, 19.03	1003	8,943	17.2	15.8, 18.7	441	3,926	18.2	

Midwest	2338	22,084	24.7	22.98, 26.33	1353	13,057	25.2	22.9, 27.4	559	5,515	25.6	22.2, 28.9
South	3696	31,988	35.7	33.95, 37.48	1951	17,121	33.0	30.9, 35.1	765	6,498	30.1	27.5, 32.7
West	2288	19,559	21.8	20.51, 23.16	1459	12,768	24.6	22.9, 26.4	660	5,628	26.1	23.8, 28.4

[a]Data source: 2007 National Health Interview Survey.

Table5.4: Characteristics of Women And Men Ages 50 And Older Who Used A CAM for Health and Well-Being in the Last 12 Months, 2007 National Health Interview Survey[a]

Table 5.4: Characteristics of Women and Men Ages 50 And Older Who Used A CAM for Health and Well-Being in the last 12 Months, 2007 National Health Interview Survey[a]

	Age 50 and Older				Age 50 and Older Who Use a CAM for Physical Performance				Age 50 and Older Who Use a CAM for Energy			
	n = 10,096				n = 1,768				n = 1,095			
	n	N / 1,000	%	CI	n	N / 1,000	%	CI	n	N / 1,000	%	CI
Gender												
Women	5734	48,201	53.8	52.7, 55.0	1099	9,804	61.6	59.0, 64.1	748	6,754	66.9	57.5, 63.9
Men	4362	41,363	46.2	45.0, 47.3	669	6,124	38.4	35.9, 41.0	347	3,334	33.1	37.6, 3
Race/Ethnicity									347			
Asian	398	3,321	3.7	3.2, 4.2	70	645	4.0	2.8, 5.3	64	459	4.6	2.9, 2.7
African Americans	1467	8,757	9.8	9.0, 10.5	184	1,068	6.7	5.5, 7.9	97	627	6.2	6.3, 4.8
Hispanic	1135	7,236	8.1	7.3, 8.9	176	1,116	7.0	5.7, 8.3	95	557	5.5	5.0, 4.2
White	7011	69,479	77.6	76.4, 78.8	1326	12,986	81.5	79.4, 83.7	825	8,324	82.5	79.6, 79.7
Other	85	770	0.9	0.5, 1.2	12	114	0.7	0.3, 1.1	14	121	1.2	0.5, 0.4
Income to Poverty Ratio												
less than 1	1260	7,888	8.8	8.1, 9.5	158	887	5.6	4.6, 6.5	110	701	6.9	5.3, 5.4
1 to less than 2	2070	16,016	17.9	17.0, 18.8	277	2,128	13.4	11.3, 15.4	139	1,104	10.9	13.2, 8.9
2 to less than 3	1787	15,711	17.5	16.7, 18.4	333	2,913	18.3	16.2, 20.4	175	1,548	15.3	15.5, 13.2
3 to less than 4	1222	11,036	12.3	11.6, 13.1	226	2,002	12.6	10.8, 14.3	117	923	9.1	11.4, 7.3
4 to less than 5	1026	9,877	11.0	10.3, 11.8	223	2,174	13.6	11.8, 15.5	126	1,142	11.3	10.4, 9.2
5 and over	2731	29,035	32.4	31.1, 33.8	551	5,825	36.6	33.6, 39.6	428	4,671	46.3	34.7, 41.9
50 to 54	2109	20,841	23.3	22.2, 24.4	365	3,503	22.0	19.8, 24.2	323	3,240	32.1	24.1, 29.3
55 to 59	1790	17,135	19.1	18.1, 20.2	313	2,941	18.5	16.4, 20.5	264	2,622	26.0	17.8, 23.2
60 to 64	1617	15,458	17.3	16.3, 18.2	302	3,166	19.9	17.7, 22.1	169	1,692	16.8	16.6, 14.2

65 to 69	1369	11,074	12.4	11.6, 13.1	242	1,931	12.1	10.6, 13.6	132	978	9.7	10.4, 7.8
70 to 75	1047	8,172	9.1	8.5, 9.8	189	1,513	9.5	8.1, 10.9	71	556	5.5	6.5, 4.0
75 to 79	903	7,361	8.2	7.6, 8.8	171	1,483	9.3	7.9, 10.7	67	464	4.6	7.3, 3.4
80 to 84	718	5,508	6.1	5.6, 6.7	110	813	5.1	4.0, 6.2	42	291	2.9	4.1, 2.0
85+	543	4,014	4.5	4.0, 4.9	76	579	3.6	2.8, 4.5	27	246	2.4	2.2, 1.4
Insurance Status												
Uninsured	901	7,902	8.8	8.2, 9.5	121	1,060	6.7	5.5, 7.9	98	824	8.2	6.5, 6.4
Dual eligible	464	2,866	3.2	2.8, 3.6	57	317	2.0	1.4, 2.6	39	231	2.3	1.8, 1.4
Medicaid only	306	1,948	2.2	1.8, 2.5	35	212	1.3	0.7, 1.9	27	190	1.9	1.3, 0.9
Medicare only	1473	10,978	12.3	11.5, 13.0	248	1,864	11.7	1, 13.4	92	620	6.1	8.6, 4.8
Medicare Plus	2417	20,706	23.1	22.0, 24.2	477	4,104	25.8	23.3, 28.2	213	1,738	17.2	21.7, 14.7
Other Public Health Insurance	353	3,159	3.5	3.1, 4.0	60	531	3.3	2.4, 4.3	41	325	3.2	2.6, 2.4
Private Insurance	4182	42,003	46.9	45.5, 48.3	770	7,841	49.2	46.2, 52.2	585	6,160	61.1	48.3, 56.9
Marital Status												
Never married	807	5,308	5.9	5.4, 6.5	113	754	4.7	3.8, 5.7	110	750	7.4	4.7, 6.2
Married	4904	56,673	63.3	62.1, 64.4	901	10,417	65.4	62.9, 67.9	499	6,158	61.0	60.1, 57.4
Separated, Divorced, Widowed	4324	27,213	30.4	29.3, 31.4	744	4,708	29.6	27.3, 31.8	479	3,117	30.9	29.5, 27.4
Marital Status Unknown	61	370	0.4	0.3, 0.5	10	50	0.3	0.1, 0.5	7	63	0.6	0.2, 0.1
Education Levels												
≤ 8	975	6,970	7.8	7.1, 8.4	107	780	4.9	3.9, 5.9	39	299	3.0	3.3, 2.0
8 – 12	1078	8,586	9.6	8.9, 10.3	123	1,039	6.5	5.3, 7.8	64	498	4.9	6.1, 3.6
High school Diploma	4689	42,140	47.0	45.8, 48.3	843	7,576	47.6	44.8, 50.3	429	3,844	38.1	42.4, 34.8
Associate's Degree	841	7,701	8.6	8.0, 9.2	190	1,718	10.8	9.2, 12.4	121	1,140	11.3	9.7, 9.0
Bachelor's Degree	1454	13,928	15.6	14.6, 16.5	296	2,759	17.3	15.2, 19.5	250	2,335	23.1	17.3, 20.3
Master's, PhD, MD	948	9,348	10.4	9.6, 11.3	200	1,984	12.5	10.4, 14.5	191	1,960	19.4	11.4, 17.1
Education missing	111	891	1.0	0.8, 1.2	9	72	0.5	0.2, 0.7	1	12	0.1	0.1, 0.1
Health Risks												

Smoking	1526	13,134	14.7	13.7, 15.6	250	2,259	14.2	12.0, 16.4	153	1,526	15.1	12.7, 11.2
Underweight	165	1,390	1.6	1.2, 1.9	26	193	1.2	0.7, 1.7	12	73	0.7	0.6, 0.3
Normal weight	3120	27,311	30.5	29.5, 31.5	605	5,327	33.4	31.0, 35.9	400	3,629	36.0	32.3, 32.9
Overweight	3630	32,875	36.7	35.5, 38.0	637	5,994	37.6	34.8, 40.5	391	3,786	37.5	34.3, 32.9
Obese	2614	23,090	25.8	24.7, 26.9	446	4,000	25.1	22.9, 27.4	253	2,273	22.5	23.1, 19.8
BMI Missing	567	4,898	5.5	4.9, 6.0	54	414	2.6	1.9, 3.3	39	327	3.2	2.1, 2.1
Health Status												
Health better	1536	13,773	15.4	14.53, 16.22	324	2,980	18.7	16.8, 20.6	254	2,405	23.8	18.0, 20.7
Health the same	7308	65,294	72.9	71.81, 74.00	1238	10,988	69.0	66.9, 71.1	725	6,604	65.5	67.0, 62.5
Health worse	1156	9,770	10.9	10.17, 11.65	203	1,940	12.2	10.3, 14.0	114	1,068	10.6	9.8, 8.4
Health missed	96	726	0.8	0.63, 0.99	3	21	0.1		2	11	0.1	
Self reported health												
Excellent/very good/good health	7755	70,114	78.3	77.28, 79.29	1401	12,750	8.0	77.8, 82.3	910	8,514	84.4	79.3, 82.0
Fair/poor health	2341	19,450	21.7	20.71, 22.72	367	3,178	2.0	17.7, 22.2	185	1,574	15.6	17.3, 13.2
Chronic conditions												
Musculoskeletal	5060	44,025	49.2	47.96, 50.35	1050	9,569	60.1	57.4, 62.8	581	5,360	53.1	52.2, 50.1
Endocrine, Nutrition, Metabolic	1695	13,917	15.5	14.68, 16.39	255	2,239	14.1	12.0, 16.1	133	1,137	11.3	12.3, 9.1
Circulatory	5750	49,346	55.1	53.92, 56.27	1002	8,772	55.1	52.1, 58.0	535	4,718	46.8	51.5, 43.3
Depression	401	3,132	3.5	3.07, 3.92	105	920	5.8	4.2, 7.3	74	614	6.1	3.9, 4.1
Weight problems	265	2,291	2.6	2.24, 2.88	76	735	4.6	3.5, 5.8	41	347	3.4	2.9, 2.4
Cancer	1462	13,006	14.5	13.67, 15.37	322	2,776	17.4	15.6, 19.3	156	1,316	13.0	15.5, 10.6
Nervous, Sensory	1180	10,064	11.2	10.43, 12.04	212	1,815	11.4	9.7, 13.1	112	910	9.0	9.3, 7.1
Memory / Cognition problems	1121	9,042	10.1	9.41, 10.78	195	1,557	9.8	8.4, 11.2	110	793	7.9	8.5, 6.1
Region												
Northeast	1774	15,933	17.8	16.55, 19.03	279	2,443	15.3	13.5, 17.2	185	1,620	16.1	16.2, 13.9
Midwest	2338	22,084	24.7	22.98, 26.33	422	4,171	26.2	22.7, 29.6	245	2,686	26.6	22.2, 20.3
South	3696	31,988	35.7	33.95, 37.48	625	5,326	33.4	30.6, 36.3	314	2,739	27.2	27.5, 23.7

West	2288	19,559	21.8	20.51, 23.16	442	3,989	25.0	22.4, 27.7	351	3,043	30.2	23.8, 26.3

[a]Data source: 2007 National Health Interview Survey.

Table 5.5: Unadjusted Results for use of CAM for Health and Well-Being in the Last 12 Months, among Women and Men age 50 and over, 2007 National Health Interview Survey[a]

	Age 50 and Older Who Use a CAM for General health				Age 50 and Older Who Use a CAM for Immune Function				Age 50 and Older Who Use a CAM for Physical Performance				Age 50 and Older Who Use a CAM for Energy			
Effect	OR	LB	UB	P-Value	OR	LB	UB	P-Value	OR	LB	UB	P-Value	OR	LB	UB	P-Value
Gender																
Men	1.00				1.00				1.00				1.00			
Women	1.51	1.38	1.65	***	1.39	1.24	1.56	***	1.47	1.30	1.66	***	1.86	1.59	2.18	***
Ethnicity																
White	1.00				1.00				1.00				1.00			
Hispanic	0.48	0.40	0.56	***	0.66	0.54	0.81	***	0.79	0.64	0.98	*	0.61	0.46	0.82	**
Asian	0.92	0.70	1.21		1.00	0.73	1.38		1.05	0.73	1.51		1.18	0.73	1.90	
African American	0.54	0.46	0.62	***	0.66	0.55	0.80	***	0.60	0.49	0.74	***	0.57	0.43	0.75	***
Other	0.68	0.36	1.26		1.18	0.63	2.19		0.75	0.38	1.49		1.36	0.70	2.66	
Income to need ratio																
≤ 1	0.52	0.44	0.62	***	0.61	0.50	0.74	***	0.63	0.49	0.81	***	0.98	0.72	1.32	
1 to <2	0.64	0.55	0.75	***	0.71	0.59	0.84	***	0.71	0.57	0.88	**	0.75	0.56	1.01	+
2 to <3	0.86	0.74	1.01	+	0.90	0.74	1.09		1.02	0.81	1.27		1.19	0.88	1.60	
3 to <4	1.00				1.00				1.00				1.00			
4 to <5	1.08	0.91	1.29		1.04	0.85	1.26		1.29	1.03	1.61	*	1.44	1.08	1.91	*
5 +	1.40	1.21	1.61	***	1.09	0.93	1.28		1.12	0.91	1.37		1.94	1.48	2.53	***

[a]Data source: 2007 National Health Interview Survey. OR=Odds Ratio; UB, LB=Upper and lower bounds of the 95% confidence interval. Reference categories: non-Hispanic White, men, ages 50-54, married, high school graduate, income-to-need ratio 3 to <4, private health insurance, normal weight, health status unchanged in past 12 months, excellent/very good/good self-reported health, South. Public health insurance = not covered by Medicare, Medicaid, private health insurance, and not uninsured. *p<.05, **p<.01, ***p<.001

Table 5.6: Multivariate Logistic Analysis Predicting the Likelihood of Using a CAM during the Past 12 Months, Women and Men Ages 50 and Older, 2007[a]

	Age 50 and Older Who Use a CAM for General health				Age 50 and Older Who Use a CAM for Immune Function				Age 50 and Older Who Use a CAM for Physical Performance				Age 50 and Older Who Use a CAM for Energy			
	OR	**LB**	**UB**	**p-value**	**OR**	**LB**	**UB**	**p-value**	**OR**	**LB**	**UB**	**p-value**	**OR**	**LB**	**UB**	**p-value**
Effect																
Exposure Variables																
Gender																
Women	1.71	1.54	1.90	<.0001	1.41	1.24	1.6	<.0001	1.49	1.30	1.7	<.0001	2.03	1.69	2.4	<.0001
Men	1.00				1.00				1.00				1.00			
Ethnicity																
White	1.00				1.00				1.00				1.00			
Hispanic	0.66	0.55	0.80	<.0001	0.84	0.68	1.1	0.13	1.10	0.87	1.4	0.42	0.77	0.56	1.1	0.10
Asian	0.93	0.68	1.29	0.6789	1.02	0.72	1.5	0.89	1.26	0.88	1.8	0.21	1.08	0.62	1.9	0.79
African American	0.75	0.63	0.89	0.0009	0.81	0.66	1.0	0.04	0.78	0.62	1	0.03	0.69	0.51	0.9	0.02
Other	0.87	0.48	1.57	0.6369	1.34	0.71	2.6	0.37	0.97	0.49	1.9	0.94	1.30	0.59	2.9	0.52
Income to poverty ratio																
≤ 1	0.76	0.61	0.94	0.0131	0.67	0.52	0.9	0.00	0.64	0.48	0.8	0.00	1.31	0.90	1.9	0.16
1 to <2	0.80	0.67	0.95	0.0116	0.84	0.68	1.0	0.10	0.73	0.57	0.9	0.01	1.07	0.77	1.5	0.69
2 to <3	0.93	0.78	1.11	0.413	0.96	0.79	1.2	0.73	1.03	0.81	1.3	0.82	1.40	1.04	1.9	0.03
3 to <4	1.00				1.00				1.00				1.00			
4 to <5	1.04	0.86	1.26	0.6627	1.02	0.82	1.3	0.85	1.28	1.00	1.7	0.05	1.38	1.02	1.9	0.04
5 +	1.25	1.07	1.47	0.0045	1.01	0.83	1.2	0.96	1.12	0.90	1.4	0.32	1.61	1.19	2.2	0.00
Predisposing / Demographic																
Age Ranges																
ages 50 to 54	1.00				1.00				1.00				1.00			
ages 55 to 59	1.10	0.94	1.28	0.2265	0.85	0.72	1.0	0.04	0.99	0.80	1.2	0.91	0.95	0.78	1.1	0.58

Table 5.6 (continued)

ages 60 to 64	1.09	0.93	1.29	0.2824	0.88	0.73	1.1	0.20	1.20	0.97	1.5	0.09	0.65	0.52	0.8	0.00
ages 65 to 69	0.89	0.72	1.10	0.2825	0.67	0.52	0.9	0.00	0.88	0.68	1.2	0.37	0.58	0.39	0.9	0.01
ages 70 to 74	0.97	0.77	1.20	0.7539	0.54	0.42	0.7	<.0001	0.94	0.71	1.3	0.67	0.43	0.29	0.7	<.0001
ages 75 to 79	0.92	0.71	1.18	0.4968	0.66	0.50	0.9	0.00	1.00	0.73	1.4	0.97	0.37	0.24	0.6	<.0001
ages 80 to 84	0.86	0.66	1.13	0.2813	0.50	0.36	0.7	<.0001	0.71	0.49	1	0.06	0.33	0.20	0.5	<.0001
85 and older	0.71	0.52	0.98	0.0342	0.33	0.22	0.5	<.0001	0.66	0.45	1	0.03	0.34	0.19	0.6	0.00
Marital status																
Married	1.00				1.00				1.00				1.00			
Never Married	0.90	0.73	1.09	0.2784	1.04	0.84	1.3	0.72	0.92	0.70	1.2	0.54	1.39	1.07	1.8	0.01
Separated, Divorced, Widowed	0.94	0.84	1.06	0.3329	1.18	1.04	1.3	0.01	0.99	0.86	1.1	0.83	1.29	1.04	1.6	0.02
Marital Status Unknown	1.31	0.63	2.74	0.4727	1.49	0.74	3.0	0.27	1.11	0.45	2.7	0.82	2.48	0.96	6.4	0.06
Predisposing / Social Structure																
Education Levels																
≤ 8	0.70	0.57	0.86	0.0008	0.65	0.49	0.8	0.00	0.72	0.55	0.9	0.01	0.69	0.44	1.1	0.10
8 – 12	0.71	0.60	0.83	<.0001	0.86	0.70	1.1	0.17	0.71	0.56	0.9	0.00	0.75	0.53	1.1	0.10
High School Diploma	1.00				1.00				1.00				1.00			
Associate's Degree	1.31	1.07	1.61	0.009	1.46	1.20	1.8	0.00	1.25	1.00	1.6	0.05	1.52	1.13	2	0.01
Bachelor's Degree	1.48	1.26	1.73	<.0001	1.39	1.20	1.6	<.0001	1.10	0.91	1.3	0.33	1.87	1.52	2.3	<.0001
Master's, PhD, MD	1.32	1.07	1.62	0.009	1.40	1.14	1.7	0.00	1.17	0.94	1.5	0.17	2.41	1.93	3	<.0001
Education missing	0.45	0.29	0.69	0.0003	0.43	0.23	0.8	0.01	0.58	0.32	1.1	0.08	0.19	0.03	1.4	0.11
Enabling / Family																
Insurance Coverage																
Private Health Insurance	1.00				1.00				1.00				1.00			
Dual eligible	0.89	0.66	1.21	0.454	1.06	0.72	1.6	0.78	0.81	0.54	1.2	0.31	1.03	0.59	1.8	0.93
Medicaid only	0.74	0.51	1.06	0.1027	1.19	0.75	1.9	0.47	0.80	0.47	1.4	0.40	0.92	0.46	1.8	0.81
Medicare only	1.06	0.86	1.32	0.5684	1.15	0.89	1.5	0.28	1.25	0.97	1.6	0.08	0.82	0.56	1.2	0.31

Table 5.6 (continued)

Medicare Plus	1.20	0.98	1.46	0.0735	1.39	1.10	1.8	0.01	1.27	0.97	1.6	0.08	1.13	0.81	1.6	0.46
Other public health insurance	0.95	0.73	1.24	0.7211	0.98	0.71	1.3	0.88	0.99	0.69	1.4	0.94	0.85	0.56	1.3	0.43
Uninsured	0.71	0.58	0.88	0.0012	1.00	0.79	1.3	0.96	0.90	0.71	1.2	0.42	0.97	0.70	1.3	0.84
Enabling / Community																
Region																
South	1.00				1.00				1.00				1.00			
Northeast	1.05	0.89	1.23	0.5695	1.27	1.07	1.5	0.01	0.87	0.70	1.1	0.23	1.10	0.87	1.4	0.42
Midwest	1.19	1.02	1.39	0.0255	1.28	1.06	1.5	0.01	1.13	0.92	1.4	0.25	1.42	1.03	2	0.03
West	1.61	1.38	1.88	<.0001	1.50	1.28	1.8	<.0001	1.17	0.98	1.4	0.08	1.82	1.49	2.2	<.0001
Need / Perceived																
Health Status																
Health same	1.00				1.00				1.00				1.00			
Health better	1.37	1.19	1.58	<.0001	1.44	1.25	1.7	<.0001	1.32	1.14	1.5	0.00	1.81	1.49	2.2	<.0001
Health worse	0.99	0.83	1.18	0.8783	1.10	0.90	1.351	0.35	1.17	0.94	1.5	0.15	1.17	0.88	1.6	0.27
Health status missing	0.17	0.08	0.36	<.0001	0.08	0.01	0.589	0.01	0.28	0.08	1	0.05	0.23	0.05	1	0.05
Self reported health																
Excellent/very good/good health	1.00				1.00				1.00				1.00			
Fair/Poor	0.82	0.71	0.94	0.0055	0.88	0.75	1.035	0.12	0.92	0.76	1.1	0.36	0.87	0.69	1.1	0.20
Need / Evaluated																
Health Risks																
Smoking	0.86	0.74	1.00	0.0525	0.92	0.78	1.077	0.29	0.98	0.81	1.2	0.81	1.00	0.73	1.4	1.00
Normal weight	1.00				1.00				1.00				1.00			
Underweight	0.57	0.39	0.83	0.0034	0.50	0.32	0.787	0.00	0.73	0.47	1.2	0.18	0.49	0.25	1	0.04
Overweight	0.95	0.83	1.09	0.4934	0.86	0.75	0.99	0.04	0.95	0.81	1.1	0.48	0.93	0.75	1.2	0.50
Obese	0.80	0.68	0.93	0.0043	0.76	0.65	0.89	0.00	0.78	0.66	0.9	0.00	0.72	0.59	0.9	0.00
BMI Missing	0.36	0.27	0.46	<.0001	0.39	0.30	0.519	<.0001	0.40	0.28	0.6	<.0001	0.47	0.30	0.7	0.00

Table 5.6 (continued)
Chronic conditions

Musculoskeletal	1.57	1.40	1.75	<.0001	1.40	1.25	1.584	<.0001	1.76	1.53	2	<.0001	1.49	1.26	1.8	<.0001
Endocrine, Nutrition, Metabolic	0.80	0.69	0.92	0.0024	0.92	0.76	1.104	0.36	0.89	0.72	1.1	0.25	0.87	0.65	1.2	0.32
Circulatory	1.13	1.02	1.26	0.0244	1.04	0.90	1.205	0.59	0.97	0.83	1.1	0.71	0.91	0.76	1.1	0.32
Depression	1.19	0.90	1.59	0.2234	1.69	1.20	2.381	0.00	1.97	1.40	2.8	0.00	1.97	1.24	3.1	0.00
Weight problems	1.08	0.76	1.52	0.6689	1.55	1.07	2.243	0.02	2.08	1.44	3	<.0001	1.32	0.83	2.1	0.24
Cancer	1.30	1.12	1.51	0.0007	1.31	1.12	1.516	0.00	1.23	1.05	1.4	0.01	0.98	0.77	1.2	0.85
Nervous, Sensory	0.92	0.77	1.10	0.3703	0.97	0.78	1.195	0.75	0.97	0.78	1.2	0.76	0.99	0.74	1.3	0.92
Memory / Cognition problems	1.08	0.90	1.30	0.4138	1.09	0.88	1.362	0.44	0.96	0.76	1.2	0.73	0.96	0.68	1.3	0.81

[a]Data source: 2007 National Health Interview Survey. UB, LB=Upper and lower bounds of the 95% confidence interval. Reference categories: men, White, ages 50-54, married, high school graduate, income-to-need ratio 3 to <4, private health insurance, normal weight, health status unchanged in past 12 months, excellent/very good/good self-reported health, South. Public health insurance = not covered by Medicare, Medicaid, private health insurance, and not uninsured.

Exhibit 5.1: Survey Questions for Physical Health

The 2007 National Health Interview Survey questions pertaining to Complementary and Alternative Medicine for Physical Health:

Used CAM for general health, general wellness, and disease prevention:

1. Did you use [fill: 1st vitamin] for any of these reasons? Please say yes or no to each. ...For general health or wellness?
2. Did you use [fill: 2nd vitamin] for any of these reasons? Please say yes or no to each. ...For general health or wellness?
3. DURING THE PAST 12 MONTHS, did you use ayurveda for any of these reasons? ...For general health or wellness?
4. DURING THE PAST 12 MONTHS, did you use biofeedback for any of these reasons?
   ...For general wellness or general disease prevention
5. DURING THE PAST 12 MONTHS, did you use chelation therapy for any of these reasons?
   ...For general wellness or general disease prevention
6. DURING THE PAST 12 MONTHS, did you use chiropractic or osteopathic manipulation for any of these reasons? ...For general wellness or general disease prevention
   ...For general wellness or general disease prevention
7. DURING THE PAST 12 MONTHS, did you use the [fill: diet used most] diet for any of these reasons? ..For general wellness or general disease prevention
8. DURING THE PAST 12 MONTHS, did you use energy healing therapy for any of these reasons? ..For general wellness or general disease prevention
9. DURING THE PAST 12 MONTHS, did you use homeopathic treatment for any of these reasons? ..For general wellness or general disease prevention
10. DURING THE PAST 12 MONTHS, did you use hypnosis for any of these reasons?
    ...For general wellness or general disease prevention
11. DURING THE PAST 12 MONTHS, did you use massage for any of these reasons?
    ...For general wellness or general disease prevention
12. DURING THE PAST 12 MONTHS, did you use [fill: type of movement technique] for any of these reasons? ..For general wellness or general disease prevention
13. DURING THE PAST 12 MONTHS, did you use naturopathy for any of these reasons?
    ...For general wellness or general disease prevention
14. DURING THE PAST 12 MONTHS, did you use [fill relaxation technique used most] for any of these reasons? ..For general wellness or general disease prevention

15. DURING THE PAST 12 MONTHS, did you see [fill: type of traditional healer] for any of these reasons? ..For general wellness or general disease prevention
16. DURING THE PAST 12 MONTHS, did you practice [fill: practice used most] for any of these reasons? ..For general wellness or general disease prevention?

Used CAM to improve immune function:

1. DURING THE PAST 12 MONTHS, did you use acupuncture for any of these reasons?
   ... To improve or enhance immune function
2. Did you use [fill: 1st herb] for any of these reasons? ...To improve immune system function?
3. Did you use [fill: 2nd herb] for any of these reasons?
   ...To improve immune system function?
4. Did you use [fill: 1st vitamin] for any of these reasons?
   ...To improve immune system function?
5. Did you use [fill: 2nd vitamin] for any of these reasons?
   ...To improve immune system function?
6. DURING THE PAST 12 MONTHS, did you use ayurveda for any of these reasons?
   ...To improve or enhance immune function
7. DURING THE PAST 12 MONTHS, did you use biofeedback for any of these reasons? ...To improve or enhance immune function
8. DURING THE PAST 12 MONTHS, did you use chelation therapy for any of these reasons? ...To improve or enhance immune function
9. DURING THE PAST 12 MONTHS, did you use chiropractic or osteopathic manipulation for any of these reasons? ...To improve or enhance immune function
10. DURING THE PAST 12 MONTHS, did you use the [fill: diet used most] diet for any of these reasons? ... To improve or enhance immune function
11. DURING THE PAST 12 MONTHS, did you use energy healing therapy for any of these reasons? ...To improve or enhance immune function
12. DURING THE PAST 12 MONTHS, did you use homeopathic treatment for any of these reasons? ...To improve or enhance immune function
13. DURING THE PAST 12 MONTHS, did you use hypnosis for any of these reasons? ...To improve or enhance immune function
14. DURING THE PAST 12 MONTHS, did you use [fill: type of movement technique] for any of these reasons? ...To improve or enhance immune function
15. DURING THE PAST 12 MONTHS, did you use naturopathy for any of these reasons? ...To improve or enhance immune function
16. DURING THE PAST 12 MONTHS, did you use [fill relaxation technique used most] for any of these reasons? ...To improve or enhance immune function
17. DURING THE PAST 12 MONTHS, did you see [fill: type of traditional healer] for any of these reasons? ...To improve or enhance immune function

18. DURING THE PAST 12 MONTHS, did you practice [fill: practice used most] for any of these reasons? ...To improve or enhance immune function?
19. DURING THE PAST 12 MONTHS, did you use massage for any of these reasons? ...To improve or enhance immune function

Used CAM to improve physical performance:

1. Did you use [fill: 1st herb] for any of these reasons? ...To improve physical performance?
2. Did you use [fill: 2nd herb] for any of these reasons? ...To improve physical performance?
3. Did you use [fill: 1st vitamin] for any of these reasons? ...To improve physical performance?
4. Did you use [fill: 2nd vitamin] for any of these reasons? ...To improve physical performance?

Used CAM to improve energy:

1. DURING THE PAST 12 MONTHS, did you use acupuncture for any of these reasons? Please say yes or no to each. ...To improve or enhance energy
2. DURING THE PAST 12 MONTHS, did you use ayurveda for any of these reasons? Please say yes or no to each. ...To improve or enhance energy
3. DURING THE PAST 12 MONTHS, did you use biofeedback for any of these reasons? Please say yes or no to each. ...To improve or enhance energy
4. DURING THE PAST 12 MONTHS, did you use biofeedback for any of these reasons? Please say yes or no to each. ...To improve or enhance energy
5. DURING THE PAST 12 MONTHS, did you use chiropractic or osteopathic manipulation for any of these reasons? Please say yes or no to each. ...To improve or enhance energy
6. DURING THE PAST 12 MONTHS, did you use the [fill: diet used most] diet for any of these reasons? Please say yes or no to each. ...To improve or enhance energy
7. DURING THE PAST 12 MONTHS, did you use energy healing therapy for any of these reasons? Please say yes or no to each. ...To improve or enhance energy
8. DURING THE PAST 12 MONTHS, did you use homeopathic treatment for any of these reasons? Please say yes or no to each. ...To improve or enhance energy
9. DURING THE PAST 12 MONTHS, did you use hypnosis for any of these reasons? Please say yes or no to each. ...To improve or enhance energy
10. DURING THE PAST 12 MONTHS, did you use massage for any of these reasons? Please say yes or no to each. ...To improve or enhance energy
11. DURING THE PAST 12 MONTHS, did you use [fill: type of movement technique] for any of these reasons? Please say yes or no to each. ...To improve or enhance energy
12. DURING THE PAST 12 MONTHS, did you use naturopathy for any of these reasons? Please say yes or no to each. ...To improve or enhance energy

13. DURING THE PAST 12 MONTHS, did you use [fill relaxation technique used most] for any of these reasons? Please say yes or no to each. ...To improve or enhance energy
14. DURING THE PAST 12 MONTHS, did you see [fill: type of traditional healer] for any of these reasons? Please say yes or no to each. ...To improve or enhance energy
15. DURING THE PAST 12 MONTHS, did you practice (fill: practice used most) for any of these reasons? Please say yes or no to each. ...To improve or enhance energy?

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