

DETERMINANTS FOR THE USE OF
COMPLEMENTARY AND ALTERNATIVE MEDICINE:
RESULTS FROM A NATIONAL STUDY

by

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ABSTRACT

Health disparities are differences that limit opportunities to attain optimal health. For many health conditions, minorities are living with or dying from the burden of disease, injury, and disability at early ages. Experts recommend specific behaviors to reduce the risk of chronic diseases and promote overall health. However, either instead of or in addition to engaging in some of the scientifically based recommendations, many individuals choose to use forms of Complementary and Alternative Medicine (CAM) to prevent or treat health related conditions. Some CAM modalities are safe and effective, some are potentially unsafe and effective, some are neutral, and others are potentially dangerous.

This study categorized CAM as safe and effective, unsafe and effective, neutral, and unsafe and ineffective; examined the use of safe and unsafe CAM therapies among a national sample of adults; identified the top three self-reported CAM modalities among a national sample of adults; and identified factors associated with patient disclosure for the top three self-reported CAM modalities. Additionally, this study ascertained the reported reasons for the use of the top three self-reported CAM modalities and determined which predisposing, enabling, need, and health behavior practices were related to CAM use among a national sample of adults. Data were extracted from the 2012 National Health Interview Survey (NHIS), and the *Sociobehavioral Model of CAM Use* (SBM of CAM Use) served as the theoretical framework. Hierarchical log-linear regression was used to identify factors that influence determinants for the use of safe and unsafe CAM among a national sample of adults.

Out of the 34,525 adults included in analysis, 75% of participants identified as White, 15% identified as AA, and 17% identified as Hispanic, and the average age of participants was 49 years old ($M=48.53$, $SD=18.165$). Chi-square analysis revealed small meaningful significant associations in the use of safe, potentially unsafe, and neutral CAM. Findings from this study provide new information on factors in the predisposing, enabling, need, and health behavior practices that influence the use safe and unsafe CAM therapies among a national sample of adults.

DEDICATION

All praise, honor, and glory to my lord and savior, Jesus Christ for allowing me to embark on this predestined journey. Thank you for your continued love, grace, and mercy.

I would like to dedicate my dissertation to my husband, Deaushay, who is the love of my life. You have shown me unconditional love and support throughout this entire process. When I was tired, or frustrated, you motivated me to continue to persevere. Thank you for being an encourager, and oftentimes, a counselor to me. I love you to the moon and back babe!

I would also like to dedicate my dissertation to my family. To my sissy, Kaitlin, thank you for always calling to check on me, lending a helping hand, and reminding me to stop and smell the roses. To my dad, Chris, thank you for your continued prayers and words of encouragement during difficult times. To my mommy, Rhonda, thank you for being my number one cheerleader for the past thirty years. You were the one who told me “*you can do it!*” from the very beginning. To my in-laws, thank you for cheering me on throughout this entire process and praying for me.

“Behind every successful woman, is a tribe of other successful women, who have her back.” – Anonymous

To Georgiana, thank you for your advice and encouragement. I am truly blessed to have you in my life. Lastly, to my friends who have become sisters (Ebony, Jazmin, Morgan, Tiara, and Tiffani) I dedicate my dissertation to you as well. I am so grateful God allowed our paths to cross. Thank you for your continued support and friendship.

LIST OF ABBREVIATIONS AND SYMBOLS

AA	African American
AH	Alternative Health
AM	Alternative Medicine
AMHU	Andersen Model for Healthcare Utilization
BMI	Body Mass Index
CAM	Complementary and Alternative Medicine
CAPI	Computer-Assisted Personal Interviewing System
CDC	Centers for Disease Control and Prevention
CHA	Complementary Health Approach
CHAs	Complementary Health Approaches
HBM	Health Belief Model
IAs	Integrative Approaches
IH	Integrative Health
NCCAM	National Center for Complementary and Alternative Medicine
NCCIH	National Center for Complementary and Integrative Health
NCHS	National Center for Health Statistics
NHIS	National Health Interview Survey
NSDUH	National Survey on Drug Use and Health
SAS	Statistical Analysis System

SPSS	Statistical Package for the Social Sciences
SEM	Social Ecological Model
SCT	Social Cognitive Theory
SBM of CAM Use	Sociobehavioral Model of CAM Use
TPB	Theory of Planned Behavior
df	Degree of Freedom
<i>N</i>	Participants in the total sample
<i>n</i>	Participants in a portion of the sample
<u><i>M</i></u>	Arithmetic mean
<i>p</i>	P-value: probability associated with the occurrence under the null hypotheses of a value of extreme as or more extreme than the observed value
SD	Standard Deviation
%	Percent
<	Less than
=	Equal to

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CHAPTER 1

INTRODUCTION

Health disparities are differences in disease, injury, and violence that affect opportunities to attain optimal health based on gender, income or education, disability, race or ethnicity, geographic location, and sexual orientation (Centers for Disease Control & Prevention [CDC], 2015). These disparities result in a multitude of factors such as environmental threats, poverty, educational inequalities, individual and behavioral factors, and inadequate access to healthcare (CDC, 2015). For many health conditions, minorities disproportionately experience the burden of disease and death (CDC, 2013). Specifically, Hispanics continue to endure higher death rates from diabetes, chronic liver disease, and kidney disease (CDC, 2015); whereas, African Americans (AA) have lower overall life expectancy and higher death rates from heart disease, stroke, and cancer than Whites (CDC, 2017).

Major challenges to lowering the death rates of chronic diseases among AAs and Hispanics include lack of knowledge about disease risk factors, lack of effective strategies for prevention, lack of comprehensive communication strategies, and late stage diagnoses (Hall, Rim, Johnson-Turbes, Vanderpool, & Kamalu, 2012). Additionally, distrust in the medical system, language barriers, health insurance status, and access to care all play roles in the health outcomes of minorities (Chao, Wade, & Kronberg, 2008; Noonan, Velasco-Mondragon, & Wagner, 2016).

These patterns of health disparities contribute to a cycle of co-morbidities, illness, and stress among minorities that are largely preventable. Experts recommend specific behaviors to reduce the risk of chronic diseases and promote overall health, including, physical activity, abstaining or quitting smoking, limiting alcohol consumption, and maintaining a healthy body weight. Additionally, eating a healthy diet that consists of a variety of fruits, vegetables, whole grains, low-fat dairy products, and lean meats is recommended to reduce the risk of chronic diseases such as heart disease, type-2 diabetes, high blood pressure and some cancers (Office of Disease Prevention and Health Promotion [ODPHP], 2016).

Either instead of or in addition to engaging in some of the scientific recommendations for disease prevention and health promotion, approximately 34% of U.S. adults use some form of Complementary and Alternative Medicine (CAM) (Clarke, Black, Stussman, Barnes, & Nahin, 2015). CAM are defined as any medical, healthcare, or healing systems other than those included in mainstream or conventional methods (National Center for Complementary and Integrative Health, 2016). Some people use CAM to improve health and wellbeing (wellness), while others (with disease conditions) use them to relieve symptoms and side effects associated with chronic disease treatment (Bishop, Yardley, & Lewith, 2007; Sirois & Gick, 2002).

CAM include a variety of practices, products, and services that are divided into five domains: mind and body medicines, whole medical systems, biological-based therapies, manipulative and body based systems and energy medicines (Fouladbakhsh & Stommel, 2007). Examples include (but are not limited to) ayurvedic medicine, chiropractic, homeopathic medicine, Native American medicine, traditional Chinese medicine, meditation, hypnosis, guided imagery, dance therapy, music therapy, art therapy, prayer and mental healing, herbal therapies, special diets, orthomolecular medicine, individual biological therapies, massages, Feldenkrais,

Alexander method, Qigong, reiki, therapeutic touch and magnet therapy (White House Commission on Complementary and Alternative Medicine Policy Report, 2002).

The 2012 National Health Interview Survey (NHIS) Adult-Supplement includes data regarding participants' use of eighteen CAM modalities. These include acupuncture, ayurveda, biofeedback, chelation therapy, chiropractic or osteopathic manipulation, craniosacral therapy, energy healing therapy, hypnosis, massage, naturopathy, traditional healers, movement therapies (Pilates/trager psychophysical integration/ Feldenkrais), herbal and non-vitamin supplements, vitamin and mineral supplements, homeopathy, special diets, yoga/tai chi/Qigong, and relaxation techniques (mediation/guided imagery/progressive relaxation) (CDC/NCHS, National Health Interview Survey, 2012). Unlike conventional medicine, limited experimental and clinical studies have been conducted on most CAM. Therefore, the distinction between CAM and conventional biomedicine are in constant flux (Leckridge, 2004).

The National Center for Complementary and Integrative Health (NCCIH) (2016) advises CAM users against the use of any product, service or practice that has not been scientifically proven safe and effective as a substitute for conventional treatment. Because some CAM modalities, unlike conventional medicine, have not undergone sufficient scientific study, accurate scientific information is not available for many of these modalities. Some are safe and effective, some are unsafe and effective, some are neutral, and others are unsafe and ineffective (Whitney & Rolfes, 2016). Therefore, examining the use of these modalities is important, because people may be putting themselves at risk by direct use of a modality or by replacing a modality and avoiding known traditional safe and effective conventional care (National Center for Complementary and Integrative Health, 2016).

Statement of the Problem

The use of CAM are common among U.S adults (Barner, Bohman, Brown, & Richards, 2010; Faith, Thorburn, & Tippens, 2013). Ample evidence suggests people's gender, age, education, marital status, income, race, and ethnicity may influence their use of CAM for treatment, health promotion, or illness prevention (Grzywacz, Lang, Suerken, Quandt, Bell & Arcury, 2005; Institutes of Medicine, 2005). In fact, an examination of the relationship between prevalence, costs, and sociodemographic variables found CAM use is greater among White, AA, and Hispanic older women with more education and higher income levels (Grzywacz et al., 2005; Institute of Medicine, 2005). Additionally, CAM use differs significantly based on an individual's stage in adulthood and in racial and ethnic groups. For example, AAs in young adulthood may use forms of CAM more often than Whites of the same age group due to higher rates of chronic diseases in AAs at earlier ages (Grzywacz et al., 2005; Mendes et al., 1997). Use of CAM can potentially be problematic if minorities are putting themselves at direct risk by replacing conventional medicine with CAM.

Another issue is the lack of patient-physician communication about the use of CAM practices, products, and services (Faith et al., 2013). Disclosure to a physician is typically the exception, not the norm, especially among members of minority groups (Arcury et al., 2012; Kennedy, Wang, & Wu, 2007). Distrust in physicians, language barriers, lack of health insurance or a regular physician, and beliefs that the doctor will not understand or discourage use can influence low rates of CAM disclosure (Chao, Quan, Sarkar, Ratanawongsa, & Schillinger, 2015; Faith et al., 2013); which may put some individuals at greater risk of complications from drug interactions and adverse side effects. Understanding factors that influence CAM utilization can assist in improving patient-physician communication.

Purpose

The purpose of this study was to categorize CAM modalities as safe and effective, unsafe and effective, neutral, and unsafe and ineffective, to examine the use of safe and unsafe CAM therapies among a national sample of adults, and to identify the top three self-reported CAM modalities among a national sample of adults. Additionally, this study identified factors associated with patient disclosure for the top three self-reported CAM modalities, ascertained the reported reasons for the use of the top three self-reported CAM, and determined which predisposing, enabling, need, and health behavior practices were related to CAM use among a national sample of adults.

Theoretical Framework

In 1968, the Andersen Behavioral Model of Healthcare Utilization was developed by Ronald M. Andersen at The University of California in Los Angeles (Andersen, 1995). The original model suggests individuals' predisposition to use of services, factors that enable or impede use, and individuals need for care, influence health service utilization (Andersen, 1995; Jahangir, Irazola & Rubinstein, 2012). The first iteration of this model comprised of three different domains: predisposing, enabling, and need factors. Predisposing factors include demographic variables such as individuals' socioeconomic status, attitudes, and beliefs (Jahangir et al., 2012). Enabling resources include factors such as an individuals' income, health insurance status, and access to a source of primary or regular care (Jahangir et al., 2012). Lastly, need factors include an individual's self-reported indicators of health status such as symptomology, lack of activity and daily activities (Jahangir et al., 2012).

Since then, Andersen et al. (2014) extended the model to focus on the individual as a unit of analysis (Andersen, Davidson, & Baumeister, 2014). The Sociobehavioral Model of CAM

Use (*SBM of CAM Use*) combines all the factors identified in the original model (predisposing, enabling, and need factors) with two enhancements. The first enhancement included contextual and individual determinants to the predisposing, enabling, and need factors to identify patterns and predictors of CAM use and explain the differences in use of conventional and CAM services (Fouladbakhsh & Stommel, 2007). The second enhancement expanded health service use to include health practices, products, and provider directed CAM services (Fouladbakhsh & Stommel, 2007).

Several studies have used the *SBM* to examine factors that enable or encourage CAM utilization (Upchurch et al., 2008; Upchurch & Rainisch, 2014; Upchurch & Rainisch, 2012). According to Upchurch and Rainisch (2012), findings demonstrate the usefulness of the *SBM* to assess factors such as predisposing, enabling, need, and health behaviors associated with the use of CAM providers, products, and practices (Upchurch & Rainisch, 2012). Additionally, the *SBM* has been empirically tested and successfully applied to individuals' use of CAM (Upchurch et al., 2008). Therefore, the *SBM* was selected as the theoretical framework for the present study to identify which predisposing, enabling, need factors, and health behaviors influence use of CAM and patient disclosure behaviors among a national sample of adults.

Independent Variables

Predisposing factors. Included gender (male, female) self-reported race (AA, White, and other), ethnicity (Hispanic), age (18-29, 30-39, 40-49, 50-59, 60-69, 70+), education (less than high school, high school, more than high school), and marital status (never married, married, cohabitating, divorced/widowed and separated) (Upchurch & Rainisch, 2015).

Enabling resources. Included household income (\leq \$34,999, \$35,000-\$49,999, \$50,000-\$74,999, \$75,000-\$99,999, \geq \$100,000), current health insurance status (yes or no), whether

conventional care was delayed or not received because of cost (yes or no), and US Census Bureau geographic region (Northeast, Midwest, South, West) (Upchurch & Rainisch, 2015).

Need factors. Included self-reported health status (excellent, very good, good, fair, and poor), and objective health status included number of diagnosed chronic health conditions prevalent among AA and Hispanics (diabetes, chronic liver disease, kidney disease, stroke, cancer, and coronary heart disease) (Upchurch & Rainisch, 2015).

Health behaviors. Included moderate/light physical activities (less than once a week, more than once a week, no activity); smoking status (current every day/ some days, former, or never smoked); alcohol consumption status (lifetime abstainer, former, current infrequent/light, current moderate/heavy). Body mass index (less than 18.5); normal weight (18.5-24.9); overweight (25-29.9); and obese (30 or greater) (Upchurch & Rainisch, 2015).

Dependent Variables

CAM use (wellness, treatment, or both). CAM modalities that are provider-directed require a practitioner for care or treatment. Therefore, if CAM modalities were provider-directed, the item “have you used a practitioner for [fill modality] in the past 12 months” was used. CAM modalities that are products are used by a practitioner but can also be used independently. Therefore, if CAM modalities were products, the item “have you used [fill modality] in the past 12 months” was used. CAM modalities that are self-directed are used independently without the use of a practitioner. Therefore, if CAM modalities were self-directed, the item “have you used [fill modality] in the past 12 months” was used.

Interviewers also asked participants if they used CAM modalities for treatment of a specific health problem or if they used CAM modalities to “improve or enhance energy,” “for general wellness or general disease prevention,” or “to improve immune function.” If

participants mentioned any of the last three reasons, this was coded as “wellness.” If participants only mentioned wellness for any modalities, this was coded as “wellness only.” If a participant mentioned using treatment for some of the modalities discussed, this was coded as “both wellness and treatment.” If a participant mentioned using any or all modalities as treatment, then this was coded as “treatment only.” Therefore, the outcome measure will be an assessment of the reason for use and coded as wellness only, both treatment and wellness and treatment only (Upchurch & Rainisch, 2015).

Patient disclosure. CAM users were asked, ‘during the past 12 months, did you let your health care provider know about your use of the top three modalities?’ For this study, patient-physician communication was coded dichotomously (disclosure versus non-disclosure) for the top three self-reported modalities. Disclosure was defined as (a) 1= used [fill top 3 modalities] in the past 12 months and told their health care provider or (b) 0= used [fill top 3 modalities] in the past 12 months and did not tell their healthcare provider.

Research Questions

The research questions for this study include:

- 1) Which types of CAM modalities are considered safe and effective, unsafe and effective, neutral, and unsafe and ineffective?
- 2) What types of CAM modalities (safe and unsafe) are African-Americans, Hispanics, and Whites using?
- 3) What are the top three self-reported CAM modalities used by African-Americans, Hispanics, and Whites?
- 4) What factors are associated with patient disclosure to physicians and the use of CAM modalities?

- 5) What are reported reasons (wellness, treatment, or wellness and treatment) for using the top three CAM modalities among African Americans, Hispanics, and Whites?
- 6) Which predisposing factors (e.g., age, marital status, education, race, and sex) influence use of CAM?
- 7) Which enabling resources (e.g., household income, current health insurance status, delay in medical care, and US Census Bureau geographic region) influence use of CAM?
- 8) How does perceived health status influence use of CAM?
- 9) How does health status evaluated by a health care provider influence use of CAM?
- 10) Which individual health behaviors (e.g., smoking status, physical activity, BMI, and alcohol status) influence use of CAM?
- 11) What individual health behaviors, predisposing factors, enabling resources and perceived health status (when combined) influence the use of safe and unsafe CAM modalities?

Significance of the Study

CAM exist on a continuum of provider-directed to self-directed modalities with a history of use and origins outside of conventional Western medicine (Clarke et al., 2015). People use modalities to relieve symptoms or side effects associated with chronic illness, to improve health and overall well-being, or to treat conditions. While some CAM appear safe and effective, others are potentially dangerous and harmful. For example, some modalities can cause adverse drug reactions or contain harmful contaminants. Additionally, the use of prescription or over-the-counter medications in conjunction with some CAM may cause severe drug interactions. People are generally hesitant to tell their traditional health care provider what CAM modalities they are using, which may place some individuals at greater risk for complications arising from adverse drug interactions.

The NHIS presents national estimates on the use of CAM among adults in the United States. Identifying factors that influence the use of safe and unsafe CAM are crucial in addressing nondisclosure rates among adults (Arcury et al., 2012). Specifically, knowledge of demographic characteristics such as age, gender, race, ethnicity, education, income, marital status, and other factors such as health status can potentially underscore the significant role of CAM in health self-management and wellness lifestyle choices among adults and provide further inquiry for patient disclosure when using CAM (Arcury et al., 2012).

Scope of the Study

This study utilized a cross-sectional survey design. Face-to-face interviews were conducted on adults aged 18 and older (CDC/NCHS, National Health Interview Survey, 2012). The 2012 Adult-Alternative supplement asked the following interview questions: had the respondent ever used the modality, and, if so, whether the modality was used in the past 12 months; number of times the respondent saw a practitioner for the modality; portion of the cost covered by insurance for the modality; amount paid out-of-pocket for the modality; and additional materials purchased to learn about the modality (CDC/NCHS, National Health Interview Survey, 2012). One adult per family was randomly selected with enhanced chances of selection for African American, Hispanic, or Asian persons aged 65 years or older (CDC/NCHS, National Health Interview Survey, 2012). The adult responded unless he or she was physically or mentally unable to do so, in which a knowledgeable proxy could answer for the sample adult (CDC/NCHS, National Health Interview Survey, 2012).

Delimitations

Delimitations of this study were as follows:

1. The study population was limited to adult men and women aged 18 years and older.
2. Participants who refused to participate were excluded from the study.
3. Commonly used health behavior theories were not used for this study.
4. Log-linear regression was used instead of logistic regression.
5. The target population for the current study included African Americans, Hispanics, and Whites. Asian Americans and Native Americans were excluded.

Assumptions

Assumptions of this study were as follows:

1. The survey was conducted using a computer-assisted personal interviewing system (CAPI) through a trained U.S. Census Bureau interviewer.
2. After explanation was provided to the participants, individuals participating in the survey understood the purpose, procedures, and questions.
3. For the Sample-Adult questionnaire, individuals provided self-report responses to questions.

Limitations

Limitations of this study were as follows:

1. The NHIS is a cross-sectional survey. Thus, causal associations cannot be made.
2. Study used data from 2012. Therefore, data may not reflect the current extent of CAM use in the United States.
3. Participants were asked to recall the use of CAM in the past 12 months, which can create recall bias for some modalities.

4. Participants may also seek to provide socially acceptable answers or report behaviors that reflect what they thought the researcher sought, which can create social desirability bias.
5. Participants may have misunderstood the terminology or phrase presented by the interviewee, which can cause question bias.
6. Individual sampling weights that adjust for nonresponse and poststratification were not analyzed due to the need for special software.
7. Culturally sensitive modalities such as home remedies or folk remedies familiar to African Americans and Hispanics were not used in the NHIS.
8. The NHIS consisted of a large sample size, which skewed significant p values. Therefore, Pearson's chi-square test for two-way and three-way interactions were limited to $<.001$ instead of $<.05$.

Definitions

Acupuncture: A technique that involves piercing the skin with long thin needles at specific anatomical points with the intention to relieve pain or illness. Acupuncture sometimes uses heat, pressure, friction, suction, or electromagnetic energy to stimulate points (Sizer & Whitney, 2017).

Alternative health approaches: the use of non-mainstream products or practices in place of conventional medicine (National Center for Complementary and Integrative Health, 2016).

Andersen Behavioral Model of Health Services: Developed in 1968 by Ronald Andersen. The original model suggests individuals' predisposition to use of services, factors that enable or impede use, and individuals need for care, influence health service utilization (Andersen, 1995; Jahangir, Irazola & Rubinstein, 2012).

Atkins diet (special diet): A controversial weight loss program that drastically reduces the daily intake of carbohydrates (40 grams or fewer) and increases protein and fat intake, which can create a potentially dangerous condition, called ketosis (Medical Dictionary for Health Professions and Nursing, 2012; Thalheimer, 2015).

Ayurveda: A variety of products (herbs, minerals, or metals) and practices with false claims aimed at integrating and balancing the body, mind, and spirit by ‘cleansing’ the body of substances that can cause disease. Cleansing practices are unnecessary and may be dangerous. (National Center for Complementary and Integrative Health, 2015).

Biofeedback: A technique that uses electronic devices to teach individuals how to regulate bodily functions, such as breathing, heart rate, and blood pressure, to improve overall health.

Biofeedback may help to reduce stress, eliminate headaches, recondition injured muscles, control asthma attacks, and relieve pain (Frank, Khorshid, Kiffer, Moravec, & McKee, 2010; National Center for Complementary and Integrative Health, 2014; Whitney & Rolfes, 2016).

Biologically based therapies: A type of CAM that uses things found in nature such as dietary supplements and herbal products (National Cancer Institute, 2005).

Certified Health Education Specialist (CHES): An individual who promotes wellness, develops and implements strategies to improve populations, and offers knowledge, skills, and training that complements health care providers, policy makers, and human resource personnel. Health educators must meet the required academic preparation qualifications, successfully pass a competency-based examination, and maintain certification through continual education (National Commission for Health Education Credentialing [NCHEC], 2018; Society of Public Health Education, 2018).

Chelation therapy: When used conventionally, it is valid treatment for removing heavy metals from the blood (including mercury). It involves intravenous injections of a chelating agent. This process is sometimes used dishonestly and unnecessarily for financial gain. (National Center for Complementary and Integrative Health, 2017; Whitney & Rolfes, 2016).

Chiropractic manipulation: A manual form of manipulation (or adjustments) that focuses on the neck, upper back, and shoulder/arm region, and lower back to align the spine (Whitney & Rolfes, 2016).

Cleanses: The process of limiting food intake to pressed juice, avoiding specific types of food, or drinking a concoction of juices that proponents falsely claim will rid the body of toxins. This practice can slow metabolism, produce temporary weight loss, cause nutrient deprivation, dehydration, cramping and renal failure (Mishori, Otubu & Alleyne, 2011).

Conventional medicine: Diagnosis and treatment of diseases that have been scientifically studied practiced by credible practitioners including medical doctors (M.D.), doctors of osteopathy (D.O.), and other allied health professionals such as physical therapists and registered nurses (National Cancer Institute, 2017).

Complementary and alternative medicine: A variety of approaches, philosophies, and treatments that are not conventional medicine. There is insufficient scientific evidence that states that modalities are safe and effective (Sizer & Whitney, 2017).

Complementary health approaches: Practices and products of non-mainstream origin with some risk of use depending on the specific product or practice (National Center for Complementary and Integrative Health, 2016).

Complementary medicine: Therapeutic techniques that are not part of standard medicine and are not integrated into the dominant healthcare system. Complementary medicine is designed to complement conventional medicine (National Center for Complementary and Integrative Health, 2016).

Contextual determinants: Circumstances and environmental factors related to health care access (Andersen, Davidson, & Baumeister, 2014).

Cramér's V: A measure of the strength of association between two categorical variables used when one of these variables has more than two categories. It is a variant of *phi* used because when one or both of the categorical variables contain more than two categories, *phi* fails to reach its minimum value of 0; which indicates no association (Fields, 2013).

Craniosacral therapy: Pressure on the sutures or connections between the cranial (head) bones. A craniosacral therapist places a small amount of pressure to the head, neck, or spine; this practice has not been sufficiently studied (Ingraham, 2016; Upledger, 2000).

Diet-related disparities: Differences in dietary intake, behaviors, and patterns within subgroups that result in poor dietary quality and an increase in health outcomes (Satia, 2010).

Energy healing therapy: Sometimes referred to as “faith healing” is a technique that involves healing energy through an individual’s hands into the patient’s body by invoking divine intervention without the use of medical, surgical, or other traditional (safe) therapy (Whitney & Rolfes, 2016).

Energy medicines: A type of CAM that involves the belief that the body has energy fields that can be used for healing and wellness (National Cancer Institute, 2005).

Feldenkrais (movement therapies): A technique that guides an individual through a series of movements and postures in an attempt to improve awareness, health, and ease of function. Based on a study conducted by Hiller and Worley (2015) Feldenkrais is a learning and self-improvement therapy, not a healing or disease-specific mechanism of action (Hillier & Worley, 2015).

Guided imagery (relaxation technique): A technique that guides individuals to a desired physical, emotional, or spiritual state through visualization of detailed images (Whitney & Rolfes, 2016).

Health Belief Model: A health behavior theory that focuses on personal beliefs or perceptions regarding prevention, detection, or controlling illness conditions (Albashtawy et al., 2016; Hayden, 2014).

Herbal and non-vitamin supplements: Herbs or other nonvitamin supplements such as pills, capsules, tablets, or liquids that contain one or more ingredients (including, herbs, or botanicals, or other substances). Usually taken either to counterbalance an unhealthy diet or to improve on an already abundant intake of nutrients (Sizer & Whitney, 2017).

Homeopathic treatment: Unfounded practice based on the theory that ‘like cures like,’ that is, any substance that can produce symptoms of disease or illness in a healthy person can cure those symptoms in a sick person (Whitney & Rolfes, 2016).

Hydrotherapy: The use of exercises in water, aquatic, or pool for various treatments (Mooventhan & Nivethitha, 2014).

Hypnosis: Also referred to as hypnotherapy, a technique that uses a trancelike state that resembles sleep and the power of suggestion in order to improve health behaviors, relieve pain, and heal (Whitney & Rolfes, 2016).

Integrative approaches: Combines conventional medicine and Complementary and Alternative Medicine treatments for which there is some scientific evidence of safety and effectiveness. Integrative approaches emphasize the importance of the relationship between the practitioner and the patient and focuses on wellness, healing, and the whole person (National Center for Complementary and Integrative Health, 2016).

Ketosis: An undesirable high concentration of ketone bodies, such as acetone, in the blood or urine. This can result from a diet that is very low in carbohydrate (Sizer & Whitney, 2017).

Macrobiotic diet (special diet): Diet low in fat that emphasizes whole grains, legumes, and vegetables with small amounts of fruits, fish, nuts and seeds. Of particular importance is the consumption of fresh, nonprocessed foods (Whitney & Rolfes, 2016).

Manipulative and Body-based systems: A type of CAM that is based on working with one or more parts of the body (National Cancer Institute, 2005).

Massage: Manipulation of tissues (by rubbing, kneading, or tapping) with the hand or an instrument for relaxation or therapeutic purposes (National Center for Complementary and Integrative Health, 2017).

Meditation (relaxation technique): A self-directed technique of relaxing the body and calming the mind; people learn to focus their attention and suspend the stream of thoughts that normally occupy the mind. This practice is designed to enhance relaxation (Whitney & Rolfes, 2016).

Minerals: Naturally occurring, inorganic, substances (Sizer & Whitney, 2017)

Mind-body medicines: A type of CAM that is based on the belief that a person's mind is able to affect the body (National Cancer Institute, 2005).

Mindfulness meditation: A type of meditation based on the concept of being mindful, or having increased awareness of the present. It uses breathing methods, guided imagery, and other practices to relax the body and mind and help reduce stress. It is also known as mindfulness relaxation and mindfulness-based stress reduction (Baer, 2013).

Naturopathy: A system based on the not fully substantiated belief that there is a healing power in the body that establishes, maintains, and restores health. Naturopathy integrates several practices, including traditional medicine, herbal medicine, clinical nutrition, homeopathy, acupuncture, East Asian medicine, hydrotherapy, and manipulative therapy (Whitney & Rolfes, 2016).

Ornish diet (special diet): A high-fiber, low-fat vegetarian diet (e.g. grains, legumes, beans, and peas) that promotes weight loss and health by controlling what one eats, and not by restricting the intake of calories; assists in prevention of heart disease, strokes, diabetes and other high fat consumption conditions (Orenstein, 2012).

Osteopathic manipulation: A full-body system of hands-on techniques designed to alleviate pain, restore function, and promote health and wellbeing (American Osteopathic Association, 2017).

Phi: A measure of the strength of association between two categorical variables. *Phi* is used with 2x2 contingency tables, and it is a variant of the chi square test (Fields, 2013).

Pilates (movement therapies): Controlled movements that are typically performed on a floor mat or with the use of specialized apparatus. Pilates improves flexibility and stability by strengthening the muscles and emphasizes breathing and balance (Pilates, 2000).

Placebo effect: A change that occurs in response to expectations about the effectiveness of a treatment that has no pharmaceutical effects (Whitney & Rolfes, 2016).

Pritikin diet (special diet): A low-fat, low in cholesterol diet that emphasizes the consumption of foods with high volumes of fiber and water, including many vegetables, fruits, beans, and whole grains (Marjolijin & Zoumbaris, 2003).

Progressive relaxation (relaxation technique): A technique used to relieve tension and stress by systematically tensing and relaxing successive muscle groups (National Center for Complementary and Integrative Health, 2016).

Qi gong: An ancient Chinese discipline combining the use of physical movement, mental focus, and deep breathing directed toward specific parts of the body to enhance the flow of qi (vital energy) in the body (Whitney & Rolfes, 2016).

Registered Dietician Nutritionist (RDN) or Registered Dietician (RD): An expert in food and nutrition who has met the commission on dietetic registration's (CDR) criteria to earn the RDN credential. RDN's works in a variety of settings such as health care, business and industry, community/public health, education, research, government agencies, and private practice. RD's and RDN's are the same credential, however, many use RDN's as a newer designation (Commission on Dietetic Registration, 2018; Sizer & Whitney, 2017).

Social Cognitive Theory: A health behavior theory based on the belief that a person's behavior is mediated by their environment and personal factors (Hayden, 2014).

Sociobehavioral Model of CAM Use: An extension of the Andersen Behavioral Model of Health Services Use with two enhancements. The first enhancement included adding contextual and individual determinants to the predisposing, enabling, and need factors to identify factors and predictors of CAM use and explain the differences in use of conventional and CAM services

(Fouladbakhsh & Stommel, 2007). The second enhancement involved expanding health service use expanded to include health practices, products, and provider directed CAM services (Fouladbakhsh & Stommel, 2007).

Spiritual meditation: Performed according to the practices of one of the major religions or within a spiritual tradition. The techniques may be the same as in other types of meditation (for example, Transcendental Meditation), but the focus is on spirituality (such as repeating a spiritual, meditative phrase) (Wachholtz & Pargament, 2005).

Tai chi: A mind-body practice that originated in china as a martial art. Individuals doing tai chi move their bodies slowly and gently, while breathing deeply and meditating (National Center for Complementary and Integrative Health, 2016).

Theory of Planned Behavior: A health behavior theory that examines an individuals' intentions to engage in a behavior (Hayden, 2014).

Traditional healer: Someone who employs ancient medical practices based on indigenous theories, beliefs, and experiences handed down from generation to generation, often orally. Methods employed by traditional healers may include use of roots, herbs, manipulative therapies, ceremonies, and prayer (Koithan and Farrell, 2010; Marbella, Harris, Diehr, Ignace, & Ignace, 1998; Segen's Medical Dictionary, 2012).

Transcendental meditation: A technique of meditation that involves silently repeating a mantra (Mosby's Dictionary, 2009).

Vegetarian diet (special diet): A plant based diet that eliminates some or all animal derived foods (Sizer & Whitney, 2017).

Vitamin and mineral supplements: Supplements that contain vitamins and/or minerals. Falsely used as a preventive therapy. Can be potentially dangerous if used in excess (Whitney & Rolfes, 2016)

Vitamins: Organic compounds that are vital to life and vital to body functions (Sizer & Whitney, 2017).

Whole medical systems: A type of CAM that is based on healing systems and beliefs that have evolved over time in different cultures throughout parts of the world (National Cancer Institute, 2005).

Yoga: A combination of breathing exercises, physical postures, and mediation used to reduce stress, increase flexibility and strength (National Center for Complementary and Integrative Health, 2016).

CHAPTER 2

REVIEW OF THE LITERATURE

This chapter contains a narrative literature review on CAM use and patient disclosure among minorities. The *SBM* (an extended version of the Andersen Behavioral Model of Health Care Utilization) served as the theoretical framework, and a detailed description of determinants for the use of CAM were discussed. Additionally, books and publications related to controversies associated with specific CAM modalities were summarized. The review of the literature was conducted using SCOUT and the following systematic electronic databases: EBSCO Host, PubMed, Psych Info, Medline, and Google Scholar.

Health Issues for Diverse Populations

Health is not merely the absence of disease or injury, but rather the dynamic condition of an individual's physical, mental, and social well-being (World Health Organization [WHO], 2017). This holistic approach to health is often referred to as the dimensions of health and wellness. Individuals should be able to attain a standard of health regardless of race or ethnicity, religion, political belief, and economic or social condition (WHO, 2017). However, for many, this holistic approach to health is unattainable due to health disparities. Health disparities are differences that affect opportunities to attain optimal health due to gender, income, education, disability, race or ethnicity, geographic location, and sexual orientation (CDC, 2015).

These disparities result in a multitude of factors such as environmental threats, poverty, educational inequalities, individual and behavioral factors, and inadequate access to healthcare (CDC, 2015). For many health conditions, minorities are living with or dying from the burden of disease at earlier ages than Whites (CDC, 2017). According to the CDC, the age-adjusted death rate for AAs is 849.3 per 100,000 deaths compared to 725.4 per 100,000 deaths in the Whites (CDC, 2016). AAs have lower overall life expectancy and higher death rates from heart disease, stroke, and cancer (CDC, 2017). Conversely, despite disparities in education, employment status, and level of poverty, Hispanics have lower death rates than AAs and Whites from the majority of the ten leading causes of death. However, they experience higher death rates from diabetes, chronic liver disease, and kidney disease than Whites (CDC, 2015).

Major challenges to lowering the death rate of chronic diseases among AAs and Hispanics include lack of knowledge about disease risk factors, lack of effective strategies for prevention, lack of comprehensive communication strategies, and late stage diagnosis (Hall et al., 2012). Additionally, distrust in the medical system, language barriers, health insurance status, and access to care all play roles in the health outcomes of minorities (Chao et al., 2008; Noonan et al., 2016). These barriers contribute to a cycle of co-morbidities, illness, and stress among minorities that are largely preventable.

Experts recommend specific health behaviors such as eating healthy, physical activity, maintaining a healthy body weight, abstaining from smoking, and limiting alcohol consumption to prevent the onset of chronic health conditions.

Nutrition. Diet is significantly linked to several chronic health conditions (Whitney & Rolfes, 2016). Eating a healthy diet that consists of a variety of fruits, vegetables, whole grains, low-fat dairy products and lean meats can reduce certain risk factors associated with high blood

pressure, elevated blood glucose levels, and abdominal obesity (Whitney & Rolfes, 2016). Diet-related disparities are prominent in the U.S., especially among racial and ethnic groups, which can result in poor dietary quality and subpar health outcomes compared to Whites (Satia, 2010). Poor dietary behaviors contribute to high incidence, prevalence, and overall mortality rates (Satia, 2010).

Physical activity and or exercise. The CDC recommends at least (1) 150 minutes of moderate-intensity aerobic activity (e.g. a brisk walk) every week and muscle-strengthening activities on two or more days of the week; (2) 75 minutes of vigorous-intensity aerobic activity (e.g. jogging or running) every week and muscle-strengthening activities two or more days a week; or (3) a combination of moderate and vigorous intensity aerobic activity and muscle-strengthening activities two or more days a week (CDC, 2015). Despite the known health benefits associated with physical activity and or exercise, AAs and Hispanics have lower rates of physical activity than Whites (Bautista, Reininger, Gay, Barroso, & McCormick, 2011; Bopp et al., 2005). Substantial portions of the African American and Hispanic population lead sedentary lifestyles and do not meet the required CDC recommendations (Bautista et al., 2011; Bopp et al., 2005). Physical activity and exercise can reduce the risk of cardiovascular disease, some cancers, and diabetes. It can also help maintain weight and improve mental health (CDC, 2017).

Maintaining a healthy weight. Being overweight or obese increases the risk of developing chronic conditions such as heart disease, high blood pressure, diabetes, gallbladder disease, and sleep apnea (NIH, 2015). Therefore, maintaining healthy body weight can reduce the risk of chronic diseases. Body Mass Index (BMI) is calculated based on an individual's height and weight (CDC, 2017). There are four categories for BMI: underweight (less than 18.5); normal weight (18.5-24.9); overweight (25-29.9); and obese (30 or greater) (NIH, 2015). Among

men, the prevalence of being overweight or obese does not differ across racial and or ethnic groups (Blixen, Sing, & Thacker, 2006). However, among women, the prevalence of being overweight is highest in AA women aged 40 or older (Blixen et al., 2006). Similarly, in the Hispanic women, 77% are overweight/obese compared to non-Hispanic White women (CDC, 2018). Being overweight and obese has traditionally been linked to cost, cultural traditions, and media influence (Blixen et al., 2006).

Smoking. Smoking significantly influences adverse health-related diseases in racial and ethnic minority groups (Ho & Elo, 2013; Hooper, Rogers, & Okuyemi, 2015). The health benefits of smoking cessation can significantly reduce the risk of developing many types of cancer, heart disease, stroke and early death (CDC, 2017). Historically, African Americans disproportionately suffer from smoking-related diseases (Ho & Elo, 2013). However, since 2012, the prevalence of smoking in the U.S. has declined in every racial or ethnic minority group except those reporting multiple races (Hooper et al., 2015). Racial or ethnic groups are also more likely than Whites to attempt cessation. However, minority groups have lower odds of cessation success than Whites (Hooper et al., 2015).

Alcohol. Experts also recommend limiting alcohol intake to reduce the onset of chronic diseases (CDC, 2016). Excessive drinking can cause a multitude of short-term health risks (e.g., injuries, violence, risky sexual behaviors) and long-term health risks (e.g., high blood pressure, heart disease, cancer of the breast, mouth, throat, esophagus, liver, and colon etc.) (CDC, 2016). According to the 2007 National Survey on Drug Use and Health (NSDUH), alcohol use in adults is highest among Whites (59.8%) than African Americans (43.8%) and Hispanics (46.3%) (Chartier & Caetano, 2010). However, there are high levels of alcohol-related consequences, such as alcohol dependency, for Hispanics, Native Americans, and African Americans (Chartier

& Caetano, 2010). Alcohol-related consequences has been attributed to social, cultural, and biological factors (Chartier & Caetano, 2010).

Either instead of or in addition to engaging in some of the scientific recommendations for disease prevention and health promotion, some people choose to use forms of CAM or AM to help prevent or treat health related conditions.

Defining Complementary Health Approaches, Integrative Approaches, and Alternative Medicine

CHAs refer to the use of services, practices and/or products of non-mainstream origin (National Center for Complementary and Integrative Health, 2016). CHAs include a variety of modalities associated with an individual's health self-management (National Center for Complementary and Integrative Health, 2016). Examples include (but are not limited to) ayurvedic medicine, chiropractic, homeopathic medicine, Native American medicine, traditional Chinese medicine, meditation, hypnosis, guided imagery, dance therapy, music therapy, art therapy, prayer and mental healing, herbal therapies, special diets, orthomolecular medicine, individual biological therapies, massages, Feldenkrais, Alexander method, Qigong, reiki, therapeutic touch and magnet therapy (White House Commission on Complementary and Alternative Medicine Policy Report, 2002).

Integrative approaches (IA) are the combination of mainstream health practices with CHAs. It can be incorporated in pain and symptom management programs with the intention of reducing the need for pain medicines or alleviate serious side effects (National Center for Complementary and Integrative Health, 2016). IA is a growing phenomenon and frequently used in a variety of settings including health related behaviors such as smoking cessation and weight reduction (National Center for Complementary and Integrative Health, 2016).

Conversely, Alternative Medicine (AM) is the use of non-mainstream services, products or practices in place of conventional medicine. Individuals who use AM may encounter certain barriers associated with conventional health care such as costs, lack of trust with a physician, and lack of access to healthcare (Eisenberg, Roger, & Ettner, 1998). AM is potentially dangerous if the patient and/or caregiver does not know the risks associated with solely using AM. The National Center for Complementary and Integrative Health (NCCIH) (2016) advises CHA users against the use of any product, service or practice that has not been scientifically proven safe and effective as a substitute for conventional treatment (what do “complementary,” “alternative,” and “integrative” mean section, para. 3).

The 2012 NHIS Alternative supplement consists of eighteen modalities. These include acupuncture, ayurveda, biofeedback, chelation therapy, chiropractic or osteopathic manipulation, craniosacral therapy, energy healing therapy, hypnosis, massage, naturopathy, traditional healers, movement therapies (Pilates/trager psychophysical integration/ Feldenkrais), herbal and non-vitamin supplements, vitamin and mineral supplements, homeopathy, special diets, yoga/tai chi/qi gong, and relaxation techniques (mediation/guided imagery/progressive relaxation) (CDC/NCHS, National Health Interview Survey, 2012). Modalities can be categorized in a variety of ways. Some researchers place modalities into healing and psychological therapies (Wanchai, et al., 2010), while others place them into special diet, psychotherapy, movement and physical therapy, mind/body therapies, spiritual practices, vitamins and herbs, and other modalities (Wanchai et al., 2010).

The National Center for Complementary and Alternative Medicine (NCCAM) place modalities into five domains: mind and body medicines, whole medical systems, biological-

based therapies, manipulative and body based systems and energy medicines. See Table 2.1 for Domains for Types of Complementary and Alternative Medicine.

Table 2.1

Domains for Types of Complementary and Alternative Medicine

<u>Mind-body Medicines</u> (e.g., biofeedback, relaxation techniques, hypnosis, yoga, and Tai Chi.)	The combination of behavioral, social, psychological and spiritual approaches to health.
<u>Whole Medical Systems</u> (e.g., ayurveda, naturopathy, traditional healers, chelation therapy, and homeopathy.)	Systems of practice developed outside of conventional western approaches to health and illness.
<u>Biological-based Therapies</u> (e.g., herbal and non-vitamin supplements, vitamins and minerals, and special diets.)	Natural and biologically based products, practices, and interventions.
<u>Manipulative and Body Based Systems</u> (e.g., craniosacral therapy, chiropractic or osteopathic manipulation, massage, and movement therapies.)	Systems that are based on manipulation and/or movement of the body
<u>Energy Medicines</u> (e.g., energy healing therapy, acupuncture, and Qi Gong.)	Systems that use energy fields in and around the body to promote healing

Note. Data adapted from Fouladbakhsh & Stommel, 2007, the National Cancer Institute, and the National Center for Complementary and Alternative Medicine (NCCAM).

Benefits/ Harmful Effects of Complementary and Alternative Medicine

CAM exist on a continuum of provider-directed to self-directed modalities that are placed into three categories: (1) providers, (2) products, and (3) practices (Fouladbakhsh & Stommel, 2007; Upchurch & Rainisch, 2015). Providers include services that are delivered by an alternative healthcare practitioner (Fouladbakhsh & Stommel, 2007). Alternative healthcare barriers closely resemble conventional medicine in that healthcare access, insurance coverage, time, cost, and geographic location must be taken into consideration (Upchurch & Rainisch, 2015). Products are items or resources that can be purchased; such as supplements and vitamins and have lower financial or geographic barriers than providers (Upchurch & Rainisch, 2015). However, buying products without practitioner guidance can be deadly or harmful due to adverse reactions to drug interactions. Practices include both individual and joint activities that may not have financial barriers, but are time intensive and can require a rigorous change in lifestyle choices such a yoga, tai chi, and qigong (Upchurch & Rainisch, 2015). See Table 2.2 for Categorization of Complementary Health Approaches, Integrative Approaches, and Alternative Medicine Providers, Products and Practices.

Table 2.2

Categorization of Complementary Health Approaches, Integrative Approaches, and Alternative Medicine Provider, Products, and Practices

Providers	Products	Practices
*Acupuncture	*Herbal and Non-Vitamin Supplements	*Meditation
*Chiropractic or Osteopathic Manipulation	*Vitamins and Minerals	*Special Diets
*Naturopathy	Essential Oils	* Prayer & spiritual activities
*Ayurveda	Self-Help Books	*Yoga, Qigong, Tai Chi (includes practice or stretching)
*Massage	Educational materials: CDs, videos, audiotapes	*Energy Healing
*Special Diets- vegetarian, Ornish, Macrobiotic, Pritikin, and Atkins	Internet websites	*Use of Herbal and Non-Vitamin Supplements
*Energy healing therapy	Teas	*Guided Imagery
*Yoga, Qigong, Tai Chi	Music/art materials	*Progressive Relaxation
*Hypnosis	Magazines	*Visualization
*Shamanic healing (traditional healers)	Food Products	*Shamanic rituals/vision quests
*Craniosacral Therapy	Crystals	*Self-massage
*Homeopathy	Magnets	*Movement Therapies
*Chelation Therapy	Spa Supplies	Breathing Exercises
*Biofeedback	Spiritual Artifacts	Breathwork-pranayama
*Guided Imagery	Healing Equipment e.g. Full spectrum lights	Acupressure
*Movement therapies		Self-chakra balancing
Music therapy		Music
Folk Medicine treatment		
Spiritual healing-use of spiritual mediums, guides		

Requires CAM practitioner to provide care/treatment

Often used by CAM practitioner; can be used independently

Used independently; no practitioner required

Provider-Directed  **Self-Directed**

Note. Data adapted from Fouladbakhsh & Stommel, 2007 and Upchurch & Rainisch, 2015

*These modalities will be examined in this study. Some modalities may fall under multiple categories.

Unlike conventional medicine, some CAM have not undergone sufficient scientific study. Therefore, accurate scientific information is not available for many of these modalities. Some are safe and effective, some are unsafe and effective, some are neutral, and others are unsafe and ineffective (Whitney & Rolfes, 2016). Examining the use of these modalities is important because people may be putting themselves at direct risk by avoiding known traditional safe and effective conventional care (National Center for Complementary and Integrative Health, 2016). A review of the literature on the 2012 NHIS modalities were conducted using 2007 to 2018 systematic reviews, meta-analyses, and randomized controlled trials from the National Center for Complementary and Integrative Health PubMed database. Additionally, books and publications related to CAM modalities were used. See Table 2.3 for a complete list of the 2012 NHIS CAM modalities, description, and use.

Table 2.3

The 2012 National Health Interview Survey Modalities, Description, and Use

Complementary and Alternative Medicine	Description/Use
Acupuncture	<ul style="list-style-type: none"> • <u>Description:</u> A technique that involves piercing the skin with long thin needles at specific anatomical points. • <u>Use:</u> Studies suggest acupuncture may help to ease chronic pain (e.g., low-back pain, neck pain, and osteoarthritis/knee pain) and reduce the frequency of tension headaches. • However, clinical practice guidelines are inconsistent in recommendations. • Ongoing research is needed to explore possible mechanisms for acupuncture’s pain relieving effects. • Generally considered safe when performed by an experienced, well-trained practitioner using sterile needles. <p>National Center for Complementary and Integrative Health, 2017; Sizer & Whitney, 2017</p>
Ayurveda	<ul style="list-style-type: none"> • <u>Description:</u> A variety of products (herbs, minerals, or metals) and practices aimed at integrating and balancing the body, mind, and spirit by cleansing the body of substances that can cause disease. • <u>Use:</u> Claims to help people live long, healthy and balanced lives by treating inflammatory, hormonal, digestive and autoimmune conditions. • Some products (e.g., herbs, minerals, or metals) can cause side effects or interact with conventional medicine. • Not enough large well-controlled clinical trials and systematic reviews to prove that this modality is beneficial. <p>National Center for Complementary and Integrative Health, 2015</p>

Complementary and Alternative Medicine	Description/Use
Biofeedback	<ul style="list-style-type: none"> • <u>Description:</u> A technique that uses electronic devices to teach individuals how to regulate bodily functions, such as breathing, heart rate, and blood pressure, to improve overall health. • <u>Use:</u> Claims to help reduce stress, eliminate headaches, relieve chronic pain, urinary incontinence, tension headache. • Requires specialized equipment and must have trained biofeedback practitioner to guide the therapy. • Efficacy depends on the medical condition (has been proven to be efficacious for chronic pain, anxiety, headache). • Biofeedback is generally safe; no negative side effects have been reported. However, biofeedback may not be for everyone. Frank, Khorshid, Kiffer, Moravec, & McKee, 2010; National Center for Complementary and Integrative Health, 2014; Whitney & Rolfes, 2016
Chelation therapy	<ul style="list-style-type: none"> • <u>Description:</u> A chemical process in which a substance is used to bind molecules (such as metals or minerals) to hold them tightly. • <u>Use:</u> Has been used to treat lead poisoning or iron overload; recently tested on diabetes and coronary heart disease patients. • In 2010, Federal Drug Administration (FDA) warned against companies that claimed chelation therapy treated a variety of diseases, such as autism spectrum disorder, cardiovascular disease, Parkinson’s disease, Alzheimer’s disease, macular degeneration, and other serious conditions. The FDA stated claims are unsubstantiated, and may involve serious safety issues; even when used with medical supervision. • Based on results from the Trial to Assess Chelation Therapy (TACT), a common side effect was a burning sensation where the solution was placed in the vein. • Results from TACT found moderate reduction in the risk of some cardiac events in diabetic adults who had previously had a heart attack. • However, these results are not sufficient evidence to support chelation as post-heart-attack therapy. National Center for Complementary and Integrative Health, 2017; Whitney & Rolfes, 2016

Complementary and Alternative Medicine	Description/Use
Chiropractic or Osteopathic manipulation	<ul style="list-style-type: none"> • <u>Description:</u> A manual form of manipulation (or adjustments) that focuses on the neck, upper back, and shoulder/arm region, and lower back. • <u>Use:</u> Claims to restore health, correct alignment problems, alleviate pain, improve function, and support the body’s natural ability to heal itself. • Studies show that manipulation for low-back pain is relatively safe when performed by a trained and licensed practitioner. • Commonly reported reactions to chiropractic or osteopathic manipulation include: headache, local discomfort, and tiredness. • Core concepts of this therapy are not based on sound science. • With the exception of back pain, chiropractic manipulation has not been shown to be effective for any medical condition. Edzard, 2008; National Center for Complementary and Integrative Health, 2017; Whitney & Rolfes, 2016
Craniosacral therapy	<ul style="list-style-type: none"> • <u>Description:</u> Pressure on the sutures or connections between the cranial (head) bones. • <u>Use:</u> Believed to restore balance to the nervous system and surrounding structures that support it. • Also said to relieve symptoms of stress and tension, migraines and headaches, chronic neck and back pain, autism, brain and spinal cord injuries, chronic fatigue, and many other conditions. • Recent scientific evidence that suggests craniosacral therapy cannot actually move the bones of the skull enough to affect the pressure or circulation of the fluid surrounding the brain and spinal chord. • Limited evidence to suggests craniosacral therapy helps in treating cancer or any other disease. • Any effect craniosacral therapy has must be a complex and subtle one, since it cannot be measured. • Must be performed by a practitioner of craniosacral therapy. • Has not been proven that it works, so usually referred to as quackery. Ingraham, 2016; Upledger, 2000

Complementary and Alternative Medicine	Description/Use
Energy Healing Therapy	<ul style="list-style-type: none"> • <u>Description:</u> Sometimes referred to as “faith healing” is technique that involves healing energy through an individual’s hands into the patient’s body by invoking divine intervention without the use of medical, surgical, or other traditional (safe) therapies. • <u>Use:</u> Claims to strengthen wellness, maintain balance, prevent diseases, cope with symptoms and support medical care. • Generally safe, however, studies found side effects were similar to those who did not receive energy healing. • Should not replace conventional care. <p>National Center for Complementary and Integrative Health, 2015; Whitney & Rolfes, 2016</p>
Herbal and Non-vitamin Supplements	<ul style="list-style-type: none"> • <u>Description:</u> Herbs or other nonvitamin supplements such as pills, capsules, tablets, or liquids that contain purified nutrients and other ingredients. • Usually taken to either counterbalance an unhealthy diet or to improve on an already abundant intake of nutrients. • <u>Use:</u> Claims to meet nutrient needs lacking from diet. • Believed to prevent or reverse illness. • Herbal supplements are not risk-free, therefore individuals should consult a health-care provider who is alert to potential adverse and nutrient-drug interactions. • Majority of research on dietary supplements has failed to show benefit. • The Food and Drug Administration (FDA) does not evaluate herbs for safety or effectiveness; nor does it monitor their contents- therefore several herbs could be deadly and poisonous. <p>National Center for Complementary and Integrative Health, 2014; Sizer & Whitney, 2017</p>

Complementary and Alternative Medicine	Description/Use
Homeopathy	<ul style="list-style-type: none"> ● <u>Description:</u> Practice based on the theory that “like cures like,” that is, any substance that can produce symptoms of disease or illness in a healthy person can cure those symptoms in a sick person. ● <u>Use:</u> Claims to treat acute and chronic conditions. ● Little evidence to support that homeopathy is effective for treatment of any specific condition. ● Some homeopathic remedies can contain substantial amounts of active ingredients that can cause side effects. ● Homeopathic practitioners expect some of their patients to experience “homeopathic aggravation” which is a temporary worsening of existing conditions after taking the prescribed dose of medication. ● Limited evidence to support efficacy of homeopathy treatment. National Center for Complementary and Integrative Health, 2015; Whitney & Rolfes, 2016
Hypnosis	<ul style="list-style-type: none"> ● <u>Description:</u> Also referred to as hypnotherapy, is a technique that uses a trancelike state that resembles sleep and the power of suggestion. ● <u>Use:</u> Said to relieve pain, anxiety, heal headaches, smoking cessation, pain control. ● Has been proven to significantly improve hot flashes in post-menopausal women. ● Studies also show a slight reduction in perceived hot flashes among breast cancer survivors and improved mood and sleep. ● Risks associated with hypnosis is uncovered or repressed behaviors. National Center for Complementary and Integrative Health, 2017; Whitney & Rolfes, 2016

Complementary and Alternative Medicine	Description/Use
Massage	<ul style="list-style-type: none"> • <u>Description:</u> Manipulation of tissues (by rubbing, kneading, or tapping) with the hand or an instrument. • <u>Use:</u> Scientific evidence to support massage helps with back pain, may improve quality of life for people with depression, cancer, and HIV/AIDS. • However, research is preliminary or conflicting. • Mainly used for relaxation or therapeutic purposes. National Center for Complementary and Integrative Health, 2017
Movement Therapies (e.g., pilates/trager psychophysical integration/Feldenkrais)	<ul style="list-style-type: none"> • <u>Description:</u> A broad range of movement techniques from Eastern or Western origin • <u>Use:</u> Said to promote physical, mental, emotional, and spiritual well-being and relieve back pain, osteoarthritis, stress, and posture related pain. • Also said to improve flexibility, muscular strength and control, prevention of musculoskeletal injuries and raises body awareness. • Using movement therapy equipment improperly is a safety issue. If not used properly, the individual can strain, and or fall and become injured. • Scientist state, there are no conceivable serious risks associated with this method. Hillier & Worley, 2015; Pilates, 1998
Naturopathy	<ul style="list-style-type: none"> • <u>Description:</u> Integrates several practices, including traditional medicine, herbal medicine, clinical nutrition, homeopathy, acupuncture, East Asian medicine, hydrotherapy, and manipulative therapy. • <u>Use:</u> Used for various purposes (e.g. primary care, overall well-being, and treatment of illnesses). • Safety of naturopathy depends on the treatments being used. While many practices are likely harmless, others have known side effects and risks. • Naturopathic care has been proven to be a cost effective method in treating low-back pain. However, limited studies support the overall effectiveness. National Center for Complementary and Integrative Health, 2017; Segen’s Medical Dictionary, 2012; Sizer & Whitney, 2017; Whitney & Rolfes, 2016

Complementary and Alternative Medicine	Description/Use
Relaxation Techniques (e.g., meditation, progressive relaxation and guided imagery)	<ul style="list-style-type: none"> • <u>Description:</u> A group of techniques used to reduce stress and relieve tension. • <u>Use:</u> Said to improve conditions such as asthma, chronic obstructive pulmonary disease, and heart failure. • May be helpful in managing anxiety related illness or medical procedures, insomnia, labor pain, chemotherapy-induced nausea and temporomandibular joint dysfunction. • A substantial amount of research has been done on the health benefits associated with relaxation. However, studies have been small. National Center for Complementary and Integrative Health, 2016
Special diets	<ul style="list-style-type: none"> • <u>Description:</u> Diets that alter or remove some essential nutrients in the body. • <u>Use:</u> Mainly used for weight loss purposes. • Restriction of any of the essential nutrients needed in the body can cause a variety of health issues (muscle cramps, diarrhea, etc.). • Self-prescribed special diets are overall unhealthy; and results are largely due to water loss. Marjolijin & Zoumbaris, 2003; Medical Dictionary for Health Professions and Nursing, 2012; Ornish, 1990; Sizer & Whitney, 2017; Thalheimer, 2015; Whitney & Rolfes, 2016
Traditional Healers	<ul style="list-style-type: none"> • <u>Description:</u> Someone who employs any one of a number of ancient medical practices that are based on indigenous theories, beliefs, and experiences handed down from generation to generation, often orally. • Some methods employed by traditional healers potentially include use of herbs, manipulative therapies, ceremonies, and prayer. • <u>Use:</u> Said to help treat a variety of health issues (prevention and treatment of illness). • Often used for spiritual reasons and in tandem with conventional medicine. • However, there is limited scientific evidence on the effectiveness of traditional healers. Koithan and Farrell, 2010; Marbella, Harris, Diehr, Ignace, Ignace, 1998; Segen's Medical Dictionary, 2012

Complementary and Alternative Medicine	Description/Use
Vitamin and mineral Supplements	<ul style="list-style-type: none"> • <u>Description:</u> Inorganic and organic compounds that contribute and help maintain healthy body systems. • <i>Minerals</i> • <u>Use:</u> (In proper amounts) builds strong bones and teeth, helps vitamins and enzymes carry out metabolic processes, and maintains proper functioning of most body systems. • Only needed in small amounts • <i>Vitamins</i> • <u>Use:</u> (In proper amounts) helps to maintain your immune system, nervous system, and bones. • A varied and balanced diet provides all the essential vitamins and minerals the body needs. • Some vitamin and mineral supplements are in transition from alternative medicine to conventional medicine (begun to prove their safety and effectiveness). • However, mineral supplements are not recommended for most people. They insoluble elements can build up in the body and become toxic if consumed in excess. <p>Sizer & Whitney, 2017</p>
Yoga/Tai chi/ Qigong	<ul style="list-style-type: none"> • <u>Description:</u> A variety of mind-body practices from ancient Chinese origins that involve certain postures and movements with mental focus, breathing, and relaxation. • <u>Use:</u> Claims to improve circulation, balance and alignment. • Also said to help individuals with health conditions. • All methods appear to be safe practices (practice in these methods are unlikely to result in serious injury). • However, certain populations (such as pregnant women) should talk with their health care providers before starting any of these methods. • Reporting of safety information is low and no trial reported a serious adverse event. <p>National Center for Complementary and Integrative Health, 2016; Whitney & Rolfes, 2016</p>

Commonly used CAM among African American and Hispanic Populations

African Americans. AAs have a rich historical perspective regarding health care and disease management (Revell, 2012). As slaves, traditional Western health remedies were not offered to AAs. Therefore, alternative therapies such as plants, herbs, seeds, roots, leaves, and minerals were used as the initial attempt in addressing an illness or treating conditions (Revell, 2012). To this day, AAs continue the traditions of their ancestors. Common CAM in the AA community include herbal supplements, home remedies, natural or biological products, and prayer (Barner et. al., 2010; Jones et al., 2006).

Home remedies are food products or readily available non-food household products such as vinegar, baking soda, lemon, honey, Epsom salts, alcohol, and oils that are used to treat common symptoms and ailments (Quandt, Sandberg, Grzywacz, Altizer, & Arcury, 2015). Some products were originally marketed for health purposes, while others were never intended for health purposes. Home remedy use is typically sparse in contemporary surveys on CAM. However, the AA community has been using home remedies for decades (Quandt et al., 2015). Sources of knowledge about home remedies are either traditional (i.e., learned about as a child from parents or grandparents) or contemporary (i.e., learned about from books, television, or the internet) (Quandt et al., 2015).

Spirituality and religion play significant roles in the AA community as well. Many AAs recognize a connection between religious or spiritual beliefs and health (Dessio et al., 2004), which may explain the heavy influence of individual prayer and alternative therapies. In a study conducted by Dessio et al. (2014), researchers found a significant correlation between prayer and the use of CAM in AA women. In this study, AA women who identified as religious or spiritual were twice as likely to use some form of CAM (Dessio et al., 2004). Moreover, AAs are more

likely to use alternative therapies in conjunction with prayer than without prayer. For example, when prayer and vitamins are combined, AAs are more likely to use CAM. However, when prayer was excluded, AAs are less likely to use CAM (Jones et al., 2006). Furthermore, AAs are more likely to use CAM modalities for treatment decisions than illness prevention or health promotion purposes (Barner et al., 2010).

Historical beliefs and customs may cause many AAs to use forms of CAM; which may be dangerous if AAs do not disclose the use of CAM with a provider or they are replacing conventional medicine with CAM.

Hispanics. The Hispanic or Latino population is a diverse population with rich historical influences and traditions that affect health as well. Indigenous people from Central and South America believed that natural forces from the sea, earth, and moon played an essential role in the health of their people (Ortiz et al., 2007). In the 16th century, the Catholic religion and Hippocrates' humoral theory of health were introduced to the new world (Ortiz et al., 2007). According to the humoral theory, any imbalance of the four humors was attributed to wellness and properly restored to achieve balance (Ortiz et al., 2007). The convergence of religion and faith were considered vital to an individual's overall health and wellbeing, and became the foundation of health and disease management in the Hispanic population that still exists today (Ortiz et al., 2007).

Similar to AAs, the most commonly used therapies among Hispanics include herbal medicines/remedies, vitamins, supplements, and prayer (Heathcote, West, Hall, & Trinidad, 2011; Malika, Desai, & Belliard, 2017; Trangmar & Diaz, 2008). According to Trangmar and Diaz (2008), the top reasons for the use of CAM in the Hispanic population include being taught by family members, a failure by medical professionals to diagnose a problem, and lack of

conventional medical treatments (Trangmar & Diaz; 2008). Additionally, families that reported strong religious affiliations were more likely to use forms of CAM than those who did not have strong religious affiliations (Heathcote et al., 2011). Additionally, research suggests Hispanics used CAM for infections, digestive ailments, chronic conditions, lack of energy, and pregnancy-related conditions (Ho, Nguyen, Liu, Nguyen, & Kilgore, 2015; Trangmar & Diaz, 2008), and Hispanics believe in an integrative approach to treating infections. In a study conducted by Malika et al. (2017), researchers concluded that 75% of the Hispanic participants believed that both herbal medicine and conventional medicine combined could be effective in treating illnesses (Malika, Desai, & Belliard, 2017).

However, previous studies reported infrequent patient disclosure about CAM practices among Hispanic populations (Chao et al., 2008; Jernewal, Zea, Reisen, & Poppen; 2005). This can be potentially problematic due to the limited information on the safety of certain products and interactions with prescription and over-the counter medications.

Patient Disclosure about CAM

In general, patients are hesitant to tell traditional health care providers what CAM they are using. Nondisclosure can be attributed to doctors not asking about the use of CAM and beliefs that the doctor will not understand (Chao et al., 2008). In a systematic review conducted by Grant et al. (2012), approximately 35 to 92% of the studies reviewed showed a significant proportion of practitioners were unaware of CAM use by their patients (Grant, Bin, Kiat, & Chang, 2012). Additionally, research suggests CAM disclosure differs for specific CAM modalities (Chao et al., 2008; Grant et al., 2012). Studies have shown patients are more willing to disclose provider-directed CAM such as chiropractic manipulation or acupuncture than self-directed CAM such as vitamins, herbal medicine, and special diets (Chao et al., 2008). CAM

disclosure also varies based on race or ethnicity. African Americans, Hispanics, and Asian Americans are less likely than Whites to disclose information regarding CAM utilization (Chao et al., 2008). Nondisclosure among minorities can be attributed to barriers such as lack of adequate health care, finances, language barriers, insurance, suboptimal sources of care, and distrust in physicians (Chao et al., 2008; Noonan, Velasco-Mondragon, & Wagner, 2016).

Patient-physician trust has been linked to acceptance of recommended care, satisfaction with care, loyalty and satisfaction with the physician, self-reported health improvement, and physician control in the relationship (Jacobs, Rolle, Ferrans, Whitaker, & Warnecke; 2006). For AAs, distrust in the health care system has affected patient-physician communication; largely due to the history of maltreatment from the medical profession.

In 1932, the Public Health Service began working with the Tuskegee Institute to record the history of syphilis in hopes to create programs for AAs (CDC, 2017). The study involved over 600 AA men (399 with syphilis, and 201 without) who were being treated for what was termed 'bad blood' (CDC, 2017). Men were lured into the study with free medical exams, free meals, and burial insurance. The study was originally projected to last six months but continued for forty years (CDC, 2017). During this time, the men did not receive proper treatment to cure the illness, even though penicillin became the drug of choice for syphilis in 1947 (CDC, 2017). To this day, AAs perceptions of physicians can be attributed to the actions of the Tuskegee Study of Untreated Syphilis (CDC, 2017). Financial discrimination has also been identified as a contributing factor that impedes patient-physician communication (Jacobs et al., 2006).

Hispanics experience unique barriers that can also impede patient disclosure. Hispanics are more likely to report limited English proficiency (Chao et al., 2015; Fernandez et al., 2011). Language barriers can be associated with decreased patient satisfaction with care, problems with

medication comprehension, and decreased use of health services, even in insured patients (Fernandez et al., 2011). Moreover, previous research on patient-physician communication among African Americans and Hispanics have found that physicians exhibit better question-asking skills with White patients compared to minority patients, (Sleath, Rubin, Campbell, Gwyther, Clark; 2001) which can potentially be another barrier between patient and physician.

Nondisclosure of CAM modalities to a physician is a public health concern, especially among minorities, because studies have shown that minorities commonly use natural and biologically based products such as vitamin, and herbal supplements for treatment, illness prevention, and health promotion (Barner, et al., 2010; Heathcote et al., 2011; Jones et. al., 2006; Ryder, Wolpert, Orwig, Carter-Pokras, & Black, 2008; Trangmar & Diaz, 2008). There is ample information on the safety of natural based products, including toxicity and interactions with prescription and over-the-counter medications. Therefore, patient nondisclosure may put minorities at greater risk of complications from drug interactions and adverse side effects.

The National Health Interview Survey

In 1956, The National Health Survey Act was passed. As a result, the U.S. Public Health Service was tasked with implementing an annual survey to collect data on illnesses, injuries, morbidities, disabilities and services in the United States (CDC, National Center for Health Statistics, 2018). In 1957, the survey was coined the National Health Interview Survey (CDC, National Center for Health Statistics, 2018). Since 1960, the NHIS has been the primary source of information on the health of the civilian non-institutionalized household population and widely used by government agencies and research communities to monitor trends in the overall health of the United States (CDC, National Center for Health Statistics, 2018).

Although the survey reached many populations in the United States, several segments of the population were not represented due to technical and logistical issues. For example, patients in long-term care facilities, persons on active duty in the Armed Forces (including their dependents), and persons incarcerated, and nationals living overseas were not included in the survey (CDC, National Center for Health Statistics, 2018).

A benefit of the NHIS survey is that it oversampled individuals who were sixty-five years or older and African American, Hispanic/Latino, or Asian. Sampling was based on clusters of addresses that consisted of a county, a small group of contiguous counties, or a metropolitan statistical area (CDC, National Center for Health Statistics, 2018). Data were collected from each state and the District of Columbia. Survey participation was voluntary and confidential.

The original NHIS questionnaire format was divided into a set of basic health related items (known as the Core questionnaire) and one or more sets of questions on current health topics (CDC, National Center for Health Statistics, 2018). The revised NHIS format contained a set of core questions and supplements. Core questions were relatively unchanged and contained four major components: Household, Family, Sample-Adult Core and Sample-Child Core (CDC, National Center for Health Statistics, 2018). The Household questionnaire collected data on the demographics of individuals living in the house; the family questionnaire collected individual data on limitations, injuries, healthcare utilization, health insurance, and income/assets within a household (CDC, National Center for Health Statistics, 2018); and one sample adult were randomly selected from the household and asked questions from the Sample-Adult and Sample-Child Core questionnaire to collect information on health status, healthcare services, and behavior (CDC, National Center for Health Statistics, 2018).

The supplements provided additional information on new public health issues or additional information on a subject previously covered in the core questionnaire. The first Supplement was field tested in 1998 and focused on data needed for the Healthy People 2000 and 2010 objectives (CDC, National Center for Health Statistics, 2018). In 2002, the National Center for Complementary and Integrative Health (NCCIH) sponsored its first Complementary and Alternative Medicine Supplement for adults and children for the NHIS. Five years later, the NHIS administered its second supplement (which was slightly updated and revised) and in 2012; the third supplement was fielded.

Prevalence, Cost, and Patterns of CAM Use

In 1990, the first nationally representative survey of prevalence, costs, and patterns of CAM use was developed (Institute of Medicine, 2005). Participants were interviewed over the phone about the use of sixteen CAM modality (Institute of Medicine, 2005). One in three participants (34%) reported using at least one CAM the previous year. Results also suggested therapies were used primarily to treat chronic conditions compared to acute conditions and 72% of CAM users did not disclose therapies to a medical doctor (Eisenberg et al., 1993; Institute of Medicine, 2005).

A national follow-up study indicated a dramatic increase in the use of CAM (Eisenberg et al., 1998). From 1990 to 1997, the prevalence of CAM use increased 25% (Institute of Medicine, 2005). Prevalence of herbal remedies, high-dose vitamin use, and the total number of visits to CAM providers also increased (Institute of Medicine, 2005). Additionally, an estimated 15 million adults reported taking prescription medication concurrently with herbal remedies, high-dose vitamins or both (Institute of Medicine, 2005). Results from the follow-up study also found

that among participants who used CAM in the previous year and saw a medical doctor, 63 to 73% did not disclose CAM use to their doctors.

In 1999, the NHIS included one question about the use of alternative health care practices (Barnes, Powell-Griner, McFann, & Nahin, 2004; Institutes of Medicine, 2005). Participants were asked if they used any of the eleven listed therapies in the past 12 months (Barnes, Powell-Griner, McFann, & Nahin, 2004; Institutes of Medicine, 2005). Researchers reported a decrease in use of CAM among adults (28.9%), and consistent with prior observations, CAM were often used in conjunction with conventional medical services (Institute of Medicine, 2005). Clarke et al. (2015) performed the most recent analysis of NHIS data, which presented data on 2002, 2007, and 2012 NHIS supplements. Results from this study found that as of 2012, 34% of U.S. adults used some form of CAM (Clarke et al., 2015). This estimate was lower compared to 2002 (35%) and 2007 (38%) (Clarke et al., 2015). Clarke et al. (2015) believe differences can be attributed to which CAM modalities were included in the definition across studies (Clarke et al., 2015).

For differences in the 2012 version compared to the previous versions included an expansion of nonvitamin, nonmineral dietary supplements, the addition of both a 30-day and 12-month recall period for use of nonvitamin, nonmineral dietary supplements, a list of named traditional healers, questions about movement therapies, and detail on meditation practices (mantra, mindfulness, or spiritual).

The varying difference in use of CAM in the U.S. has solidified the need for a comprehensive framework that can help identify factors and prevalence use of CAM modalities among a national sample of adults.

The Sociobehavioral Model of CAM Use

The Andersen Healthcare Utilization Model was developed in the late 1960s by Ronald Andersen to help researchers understand conditions that either facilitate or impede health care utilization (Andersen, 1995). Specifically, he was interested in (1) why families use health services, (2) how these families define and measure equitable access to health care, and (3) developing policies to promote equitable access (Andersen, 1995). However, due to the diversity of the family unit, the model focused on the individual rather than the family (Andersen, 1995). In 1970, a second iteration was developed to include concepts of health care and consumer satisfaction (Andersen, 1995). The next iteration of the model included an individual's perceived and evaluated health status in conjunction with consumer satisfaction (Andersen et al., 2014).

For decades, the Andersen Healthcare Utilization Model was used to demonstrate factors that lead to health care utilization. However, the individual unit (an individual's health behaviors or lifestyle) was not accounted for in the early years. Therefore, an expanded version (The *SBM*) was implemented to include health practices and products, in addition to provider-directed CAM services that effect health outcomes and quality of life (Andersen et al., 2014). See Figure 2.1 for the Sociobehavioral Model of CAM Use.

Two dominant approaches have been used to study decision-making in CAM (Lorenc, Ilan-Clarke, Robinson, & Blair, 2009). The first approach is the healthcare utilization model (i.e., the Sociobehavioral Model of CAM use [*SBM*]), which focuses on factors that enable and encourage the use of CAM services. The second approach is the health behavior model (i.e., the Theory of Planned Behavior (*TPB*), the Health Belief Model (*HBM*), and the Social Cognitive Theory (*SCT*), which focuses on the decision to use CAM as a health behavior (Lorenc et al., 2009). The *SBM* is the superior model for this study because it examines the relationships

between individual, societal, and health system factors regarding CAM utilization. However, a thorough search of the literature was conducted to review articles related to CAM decision making and commonly used approaches to justify the superiority of the *SBM*.

Theory of Planned Behavior. A widely used intrapersonal health behavior theory is the *TPB*, which focuses on an individuals' intention to adopt a behavior (Montano & Kasprzyk, 2015). Direct determinants of individuals' behavioral intentions include attitudes toward performing the behavior, subjective norms associated with a behavior, and perceived control over the particular behavior (Montano & Kasprzyk, 2015).

A critical step in applying the *TPB* model is pilot testing to identify relevant behavioral outcomes, referents, facilitators, and barriers for each behavior and target population under investigation (Montano & Kasprzyk, 2015). Of the fifteen articles selected, only three articles were pilot tested (Furnham & Lovett, 2001; Nathan, Perelman, & Ben-Naftali, 2016; O'Connor & White, 2009) and one study developed a tool (Mao et al., 2012).

Another important element in creating a comprehensive *TPB* model is understanding relevant beliefs for a particular behavior can be different depending on the target population (Montano & Kasprzyk, 2015). In order to have a comprehensive *TPB* model, salient behavioral, normative, and control beliefs associated with a behavior must be identified (Montano & Kasprzyk, 2015). Of all the articles reviewed, thirteen were conducted in non-U.S. areas such as Iran, Turkey, Greece, Australia, and the United Kingdom (Barkoukis, Lazuras, Tsorbatzoudis, & Rodafinos, 2013; Dancisak, Magonet, Blaha, & Nuss, 2016; Furnham & Lovett, 2001; Godin, Beaulieu, Touchette, Lambert, & Dodin, 2007; Holmes, Bishop, & Calman, 2017; Mortazavi et al., 2017; Nathan et al., 2016; O'Connor & White, 2009; Rochelle, Shardlow, & Ng, 2015; Tarhan, Arslan, & Sar, 2017; Wilson, White, and Hamilton, 2011; Wilson & White, 2011). The

remaining two were conducted in the U.S. (Dancisak, Magonet, Blaha, Nuss, 2016; Mao et al., 2012). Both studies oversampled Whites.

Regarding study design, a prospective study is the most ideal design for the *TPB* because it can look at relationships between constructs, with attitude, subjective norms, perceived control, and intention measured at one time point and behavior measured following a time interval (Montano & Kasprzyk, 2015). However, cross-sectional studies are often used to test *TPB* (Montano & Kasprzyk, 2015). Cross-sectional designs may provide poor prediction and understanding of a previous behavior because of the time order of motivations and the fact that behaviors cannot be discerned (Montano & Kasprzyk, 2015). Of the fifteen articles reviewed, only one was a prospective study (Furnham & Lovett, 2001) and four were cross-sectional studies (Nathan et al., 2016; Tarhan et al., 2017; Wilson, Hamilton, & White, 2012; Wilson et al., 2011). The remaining studies employed either a qualitative or mixed methods methodology.

Lastly, although most researchers mix and match aspects from different theories, for a theory to be most effective, all constructs should be used (Hayden, 2014). Of the fifteen articles selected, ten used all of the *TPB* constructs (Dancisak et al., 2016; Holmes et al., 2017; Mortazavi et al., 2017; Nathan et al., 2016; O'Connor & White, 2009; Rochelle et al., 2015; Tarhan et al., 2017; Wilson et al., 2011; Wilson & White, 2011). Two were integrative models (Barkoukis et al., 2013; Hirai et al., 2008), and the remaining articles included constructs from different theories (Furnham & Lovett, 2001; Mao et al., 2012; Wilson et al., 2012).

Based on this information presented, the *TPB* is not the ideal model to use for this study. Whereas the *TPB* focuses on intention to adopt a behavior, the *SBM* focuses on explanatory factors of the choices made. In other words, the *TPB* does not take into account environmental or economic factors that influence a behavior.

Health Belief Model. Another commonly used intrapersonal theory is the *HBM*. The main purpose of this model is to predict whether and why people will take action to prevent, detect, or control illness conditions. Constructs (or components) of this model include perceived susceptibility, perceived severity, perceived benefits and barriers to engaging in a behavior, cues to action, and self-efficacy (Skinner, Tiro, & Champion, 2015). A strength of this model is sociodemographic variables (e.g., as age, sex, race, and education) can be viewed to help moderate relationships between health beliefs and health behaviors (Skinner et al., 2015). However, few studies have investigated factors that may moderate or mediate *HBM* constructs (Skinner et al., 2015). This was the case for the articles reviewed for the current literature search.

Additionally, formative research is required to identify factors for particular health behaviors among target populations and settings to ensure content validity (Skinner et al., 2015). The literature search yielded five studies. Of these, three were conducted in the U.S. (Halpin, Perkins, & Huang, 2014; Scarton et al., 2018; Wutoh et al., 2005). However, the majority of these studies oversampled Whites and none of the studies were pilot tested.

Although the *HBM* has been used to predict health behaviors and capable of examining relationships that mediate or moderate health beliefs, this is not the ideal model for this study. The *SBM* is the superior model because it not only examines sociodemographic variables, it also tests enabling, need, and health behavior factors that may influence use of CAM.

Social Cognitive Theory. A widely used interpersonal level health behavior theory is the *SCT*. This theory examines the cognitive, environmental, and behavioral influences on certain behaviors (Kelder, Hoelscher, & Perry, 2015). This triadic model includes cognitive influences (self-efficacy, collective efficacy, outcome expectations, knowledge), environmental influences on behavior (observational learning, normative beliefs, social support, barriers and

opportunities), and supporting behavioral factors (behavioral skills, intentions, reinforcement and punishment) (Kelder et al., 2015).

Because *SCT* focuses primarily on individual behavioral change, environmental influences are often overlooked. Therefore, adopting an integrated approach such as *SCT* and the Social Ecological Model (*SEM*) can be used to explore multiple levels of social and physical environment that are associated with change. Of the four articles reviewed, two employed an integrated approach to the *SCT* (Oberg et al., 2014; Williams-Piehota, Sirosis, Isenberg & Walsh, 2011). However, these studies did not utilize a community level theory such as the *SEM*, instead, one integrated the *SCT* with the Self-Determination Theory, an interpersonal theory that posits that human nature is driven to meet certain basic needs (Duggan & Street, 2015; Williams-Piehota et al., 2011) and the other integrated *SCT* with the intrapersonal HBM (Oberg et al., 2014).

Similar to the intrapersonal models, constructs are different when used with different groups. Therefore, careful tailoring is needed to create a successful intervention (Kelder et al., 2015). Although all studies reviewed were conducted in the U.S., two studies were conducted to determine the prevalence and types of CAM among undergraduate, graduate, and pre-professional college students (Nowak et al., 2015; Nowak & Dorman, 2008); which may not be indicative of educational attainment for a national representative survey like the NHIS. The remaining two articles were conducted with older adults and oversampled Whites (Oberg et al., 2014; Williams-Piehota et al., 2011).

Only one of the articles used a mixed methods approach to identify salient and powerful *SCT* constructs associated with the target behavior (Williams-Piehota et al., 2011). Three studies used a quantitative research methodology (Nowak, et al., 2015; Nowak & Dorman, 2008) and the

remaining study used a qualitative research methodology (Oberg et al., 2014). Both studies oversampled Whites, and therefore are not representative of the current study.

Although researchers have used widely known health behavior theories to explain factors that influence patients' choice to use CAM, the *SBM* is the superior model because it has been used extensively to guide research examining factors that predict utilization, it is applicable to diverse populations within a population-based sample, and has been applied to the CAM categories defined by the National Center for Complementary and Alternative Medicine (Fouladbakhsh & Stommel, 2007). Furthermore, given that most CAM modalities are used in conjunction with conventional medicine, a framework that views both CAM and conventional health services use is needed (Fouladbakhsh & Stommel, 2007).

Several studies have used the *SBM* to examine factors that enable or encourage CAM utilization (Upchurch et al., 2008; Upchurch & Rainisch, 2014; Upchurch & Rainisch, 2012). The aforementioned three studies used a nationally representative sample and utilized the NHIS (Upchurch et al., 2008; Upchurch & Rainisch, 2014; Upchurch & Rainisch, 2012). According to Upchurch and Rainisch (2012), findings demonstrate the usefulness of the *SBM* to assess factors such as predisposing, enabling, need, and health behavior practices associated with the use of CAM providers, products, and practices (Upchurch & Rainisch, 2012).

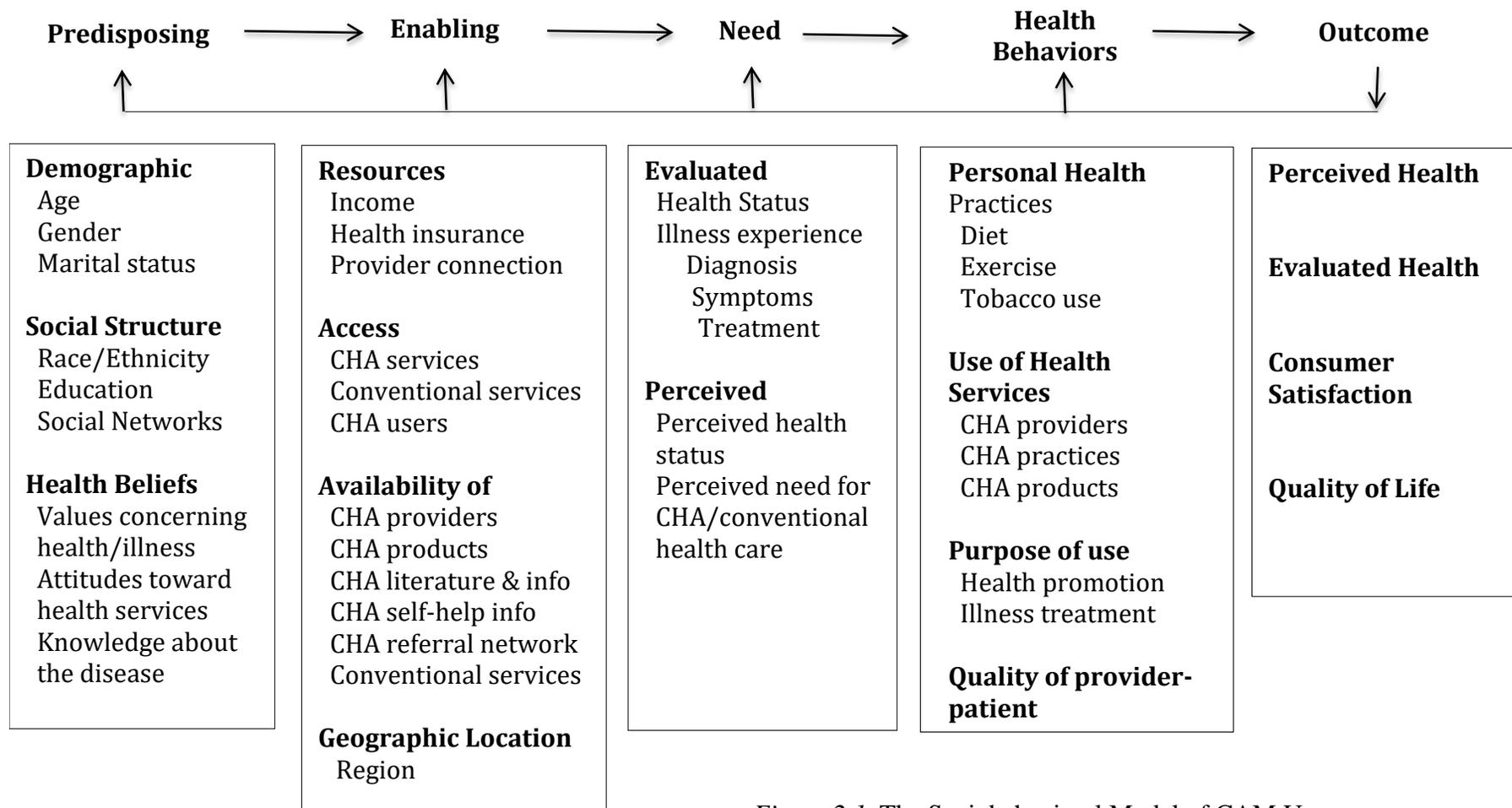


Figure 2.1. The Sociobehavioral Model of CAM Use
Note. Adapted from Andersen, Davidson, and Baumeister, 2014; Fouladbakhsh & Stommel, 2007; Upchurch & Rainisch, 2012.

The *SBM* focuses on contextual (e.g. circumstances or environment) and individual determinants. Contextual determinants are aggregate measures that range from family units to large healthcare units (Andersen et al., 2014). Conversely, individual determinants are related to membership such as work groups, family, or residence such as neighborhood, community or metropolitan areas (Andersen et al., 2014). The *SBM* contains four domains, predisposing, enabling, need, and health behaviors. Predisposing factors examine an individuals' tendency to use services. These include demographic characteristics, knowledge, attitudes, and beliefs about CAM (Upchurch & Rainisch, 2015). Enabling factors are the resources available to an individual that facilitate or impede the use of CAM services such as income and health insurance (Upchurch & Rainisch, 2015). Need factors assess an individual's need for care (Upchurch & Rainisch, 2015). Health behaviors include the personal practices an individual does to influence their health status. The ultimate focus of the model is the health behavior of individuals and the resulting outcomes of their health, satisfaction with services, and overall quality of life (Andersen et al., 2014). This contextual framework is an example of a feedback loop in which contextual characteristics can influence health behaviors and outcomes in a multitude of ways (Andersen et al., 2014).

Predisposing Factors. Aggregate and individual predisposing factors include demographic characteristics, social structure, beliefs and values, and health beliefs (Andersen et al., 2014, Fouladbakhsh & Stommel, 2007). Community and individual characteristics such as age, gender, and marital status are all factors that can potentially influence the utilization of CAM (Andersen et al., 2014). Additionally, social structure, such as race or ethnicity, education, and social networks (e.g., family, friends, and religious affiliations) are also determining factors in whether an individual will utilize health services (conventional or use of CAM) (Fouladbakhsh & Stommel, 2007). Community lifestyle and cultural practices may influence an

individual's predisposition to use CAM as well (Fouladbakhsh & Stommel, 2007). Cultural beliefs, values, and norms in the African American and Hispanic community influence the use of CAM and health services, especially regarding distrust in the medical system and cultural differences (Andersen et al., 2014; Chao et al., 2008; Fouladbakhsh & Stommel, 2007). Health beliefs explain an individual's attitude, values, and knowledge about health-related events or services (Andersen et al., 2014; Fouladbakhsh & Stommel, 2007). Lastly, personal autonomy and desire to remain in control over healthcare decisions may also be influential in making decisions about CAM use (Fouladbakhsh & Stommel, 2007).

Enabling Factors. Aggregate and individual enabling factors include resources, access, availability, and geographic location (Andersen et al., 2014, Fouladbakhsh & Stommel, 2007). Access and availability refer to the presence of CAM practices, products, and services within a community. For example, enabling factors identify CAM provider services within conventional healthcare systems, practices offered at nearby community centers, and product availability in local stores (Fouladbakhsh & Stommel, 2007). Referrals and word of mouth may also prompt individuals to use CAM (Fouladbakhsh & Stommel, 2007). Additionally, the availability and variety of CAM services in a particular region is also an enabling factor. For example, availability of third-party reimbursement for CAM provider services differs based on geographic location in the U.S. (Fouladbakhsh & Stommel, 2007). Lastly, an individual's financial resources will also play a role in the utilization of CAM. Finances (e.g., wealth and income) dictate how an individual can pay for services and whether an individual has a regular source of care such as a private doctor or community clinic (Andersen et al., 2014).

Need Factors. Individual perceived and evaluated need are also important characteristics of the use of CAM. Perceived need is how individuals view their own health status; whereas

evaluated need examines the objective measurement of a patient's physical status and need for medical care (Andersen et al., 2014; Fouladbakhsh & Stommel, 2007). Understanding the external environment is important as well. The physical environment measures death rate, occupational injuries, and disease related deaths. Additionally, mortality, morbidity, and disability rates among populations within communities is also an important factor in the use of CAM (Andersen et al., 2014).

Health Behaviors. Health behaviors are the personal practices an individual does to influence their health status. These include diet, nutrition, physical activity or exercise, stress reduction, alcohol and tobacco use, and weight management (Andersen et al., 2014). Health behavior status can potentially determine whether an individual will use provider-directed or self-directed CAM (Andersen et al., 2014).

Outcomes. Outcomes are a combination of health behaviors and individual and aggregate predisposing, enabling, and need factors. Specifically, it includes perceived health, evaluated health, consumer satisfaction, and quality of life (Andersen et al., 2014). Perceived health is based on how the individual perceives his or her health status. Conversely, evaluated health status includes the judgment of a professional and utilizes measures such as biomarkers and tests for patient physiology and function (Andersen et al., 2014). Consumer satisfaction can be measured by how the individual or patient perceives their healthcare services, and quality of life measures the outcomes of the healthcare delivery and the determinants of need and health status (Andersen et al., 2014). Quality of life can be measured through indicators such as decreased symptom reports, increased sense of well-being, reduced functional limitation, increased satisfaction, condition improvement, and increased perception of control over one's health (Fouladbakhsh & Stommel, 2007).

CHAPTER 3

METHODOLOGY

The purpose of the present study was to categorize CAM modalities as safe and effective, unsafe and effective, neutral, and unsafe and ineffective, to examine the use of safe and unsafe CAM therapies among a national sample of adults, and to identify the top three self-reported CAM modalities among a national sample of adults. Additionally, this study identified factors associated with patient disclosure for the top three self-reported CAM modalities, ascertained the reported reasons for the use of the top three self-reported CAM, and determined which predisposing, enabling, need, and health behavior practices were related to CAM use among a national sample of adults. The following chapter includes a description of the respondents, data collection procedures, data management, and data analysis for the present study.

Institutional Review Board Approval

The NHIS is listed by the University of Alabama Human Research Protection Program as one of the approved public datasets for secondary data analysis. Therefore, this study did not require submission to the IRB (see Appendix A).

Study Design

The present study utilized a cross-sectional survey design. Cross-sectional studies are observational studies that analyze data from a population at a specific point in time without manipulating the environment (Barratt & Kirwan, 2009). Some advantages to this type of study design are it is relatively inexpensive, the researcher can compare different populations at a defined time, and it provides data on the entire population under study (Barratt & Kirwan, 2009). However, cross-sectional studies do not describe cause and effect relationships; therefore causal associations cannot be made. Additionally, participants may have difficulty recalling past events, which may cause biased results.

Findings from quantitative descriptive studies are needed to describe the use of safe, potentially unsafe, and neutral CAM, examine health-self management, and identify predictors of CAM utilization and patient disclosure among a national sample of adults.

Purpose and Scope of The NHIS

The NHIS is the primary source of information on the health of the civilian non-institutionalized household population and widely used by government agencies and research communities to monitor trends in the overall health of the United States (CDC, National Center for Health Statistics, 2018). Data derived from the questionnaire have been used to track health status, healthcare access, and progress toward achieving national health objectives (CDC, National Center for Health Statistics, 2018).

The NHIS Sample Description

The NHIS samples civilian noninstitutionalized children and adults from each state and the District of Columbia (CDC, National Center for Health Statistics, 2018).

The sampling plan follows a complex cluster design that uses a representative sampling of households and non-institutionalized group quarters (CDC, National Center for Health Statistics, 2018). The first stage of sampling consist of 428 primary sampling units (PSUs) from a county, a small group of contiguous counties, or a metropolitan statistical area (CDC, National Center for Health Statistics, 2018).

Within each PSU there are area segments and permit segments (CDC, National Center for Health Statistics, 2018). Area segments consist of 8, 12, or 16 addresses in each geographic region. Permit segments consist of 4 addresses and are defined by using updated lists of building permits issued in the 2000 census (CDC, National Center for Health Statistics, 2018).

The NHIS oversamples AAs, Hispanics and Asian Americans (CDC, National Center for Health Statistics, 2018). Therefore, participants in the adult selection process who self-identify as AA, Hispanic, or Asian and 65 years or older have an increased chance of being selected as the sample adult. One procedure used for oversampling racial or ethnic groups includes screening addresses. Once the household roster identifies selected area segments, the interview continued only if the household roster contained one or more AA, Asian, or Hispanic persons (CDC/NCHS, National Health Interview Survey, 2012). If the household roster did not include these criteria, the interviewer terminated the survey, and the household was screened out (CDC/NCHS, National Health Interview Survey, 2012).

Another procedure used for oversampling AAs, Hispanics and Asian Americans includes sampling segments within PSUs. In this procedure, groups with higher racial or ethnic concentrations (i.e., AAs, Hispanics, and Asian Americans) were selected based on the 2000 census (CDC/NCHS, National Health Interview Survey, 2012).

The NHIS excludes persons living in long-term care institutions (i.e., nursing homes for the elderly, hospitals for the chronically ill or physically/intellectually disabled, and wards for abused or neglected children); correctional facilities (i.e., prisons or jails, juvenile detention centers, and halfway houses); and U.S. nationals living in foreign countries, and active-duty Armed Forces personnel (CDC, National Center for Health Statistics, 2018).

For the purpose of this study, the current sample met the following criteria: (1) adult men and women who were 18 years of age or older, (2) self-identified as African American, Hispanic, or White, and (3) used or saw a practitioner for at least one CAM modality in the past 12 months.

The NHIS Questionnaire

The NHIS questionnaire consists of two parts: (1) a set of basic health and demographic items (known as the Core questionnaire) and (2) one or more sets of questions related to new public health data needs (known as the supplements). The Core consists of four main components. These include the Household Composition Section, the Family Core (which includes person-level data), the Sample Adult Core, and the Sample Child Core (CDC/NCHS, National Health Interview Survey, 2012).

For the Household section of the questionnaire, one household member who was at least 18 years of age (19 in Alabama and Nebraska, and 21 in Mississippi) provided basic demographic and relationship information about household members (CDC/NCHS, National Health Interview Survey, 2012). For the Family core questionnaire, the interviewer identified a resident family member who was at least the age of the legal majority. He or she served as the primary respondent for the family by providing information for all the children and adult family members (CDC/NCHS, National Health Interview Survey, 2012).

For the Sample-Adult questionnaire, the interviewer identified one adult per family with enhanced chances of selection for AA, Hispanic, or Asian persons over 65 years of age. The adult responded to questions in this section unless he or she was physically or mentally unable to do so, in which case a knowledgeable substitute was identified and answered the questions (CDC/NCHS, National Health Interview Survey, 2012).

The main three supplements released in the 2012 NHIS were the Adult Functioning and Disability questionnaire, the Child Complementary and Alternative Medicine questionnaire, and the Adult Complementary and Alternative Medicine questionnaire.

The Adult Complementary and Alternative Medicine questionnaire examined information from sample adults on the use of eighteen CAM modalities. These included acupuncture, ayurveda, biofeedback, chelation therapy, chiropractic or osteopathic manipulation, craniosacral therapy, energy healing therapy, hypnosis, massage, naturopathy, traditional healers, movement therapies (Pilates/Trager psychophysical integration/ Feldenkrais), herbal and non-vitamin supplements, vitamins and minerals, homeopathy, special diets, yoga/tai chi/qi gong, and relaxation techniques (meditation/guided imagery/progressive relaxation). The interviewer asked the following questions for all eighteen modalities: (1) whether the respondent ever used the modality, and, if so, whether the modality was used in the past 12 months; (2) whether the respondent saw a practitioner for the modality; (3) portion of the cost covered by insurance for the modality; (4) amount paid out-of-pocket for the modality; and (5) additional materials purchased to learn about the modality.

In addition to questions about each CAM modality, the interviewer also asked questions related to the top three CAM modalities that were considered the most important to the respondent. Questions related to the top three modalities include: (1) reasons for using the

modality; (2) whether the modality motivated the respondent to engage in other selected health behaviors; (3) outcomes associated with using the modality; (4) whether the modality was used to treat a specific health problem or condition; (5) whether the respondent received any of a specified set of traditional medical treatments for the condition; and (6) disclosure of modality use to a conventional health care provider.

Data Collection

Data were obtained through the U.S. Census Bureau and collected continuously throughout the year by Census Bureau interviewers. The NHIS used approximately 750 trained interviewers (CDC/NCHS, National Health Interview Survey, 2012). Interviewers conducted face-to-face interviews in participants' homes and follow-up interviews over the telephone. Supervisors monitored each interviewer periodically with the Performance and Data Analysis (PANDA) system (CDC/NCHS, National Health Interview Survey, 2012). This program allowed supervisors to track response rates and completion rates monthly.

The survey was conducted using a computer-assisted personal interviewing system (CAPI). This software guided the interviewer through each question by automatically routing the interviewer to appropriate questions based on answers to previous questions. Interviewers directly entered responses to items in the computer and CAPI determined if the responses were within range, checked for consistency, and saved the responses to a survey data file. The computer also contained help facilities to assist interviewers in administering the CAPI questionnaire (CDC/NCHS, National Health Interview Survey, 2012).

Data Cleaning

Four files were merged to create a master dataset for the current study using the Statistical Analysis System (SAS) version 9.4. Selected variables of interest in the predisposing, enabling, need, and health behavior practices were extracted from the Family, Person-level, and Sample-Adult dataset, and merged to the Adult Complementary and Alternative Medicine dataset. To accomplish this, record identifiers were sorted from each file using Household Number (HHX), Family Number (FMX), and Person Number (FPX). Then variables selected from the Adult Alternative dataset and variables selected from the Sample-Adult dataset were merged using unique identifiers HHX, FMX, and FPX to create an 'in process' master dataset. The 'in process' dataset was then merged to selected variables from the Family dataset using unique identifiers HHX and FMX and a selected variable from the Person-level dataset was merged to the 'in process' dataset using unique identifiers HHX, FMX, and FPX to create the final master dataset.

Once the datasets were merged, variables of interest were combined and recoded. Combined variables included evaluated health status, wellness, traditional healers, movement therapies, relaxation techniques, special diets, yoga, tai chi, and qi gong. Following methods from Upchurch and Rainisch (2012), recoded variables included age, race, ethnicity, marital status, education, evaluated health status, wellness, physical activity, smoking status, alcohol status, movement therapies, relaxation techniques, special diets, traditional healers, yoga, tai chi, and qi gong (Upchurch & Rainisch, 2012). See Appendix B for the original items in the Family, Person-level, Sample-Adult, and Adult Complementary and Alternative Medicine dataset.

Variables of Interest

Predisposing factors. The NHIS included seven items commonly measured to assess predisposing factors, including gender, self-reported race and ethnicity, age, education, and marital status. All variables were extracted from the Sample-Adult and Family dataset; and used to describe demographic characteristics.

Enabling resources. The NHIS included four items related to enabling resources, including, household income, current health insurance status, whether conventional care was delayed or not received because of cost, and US Census Bureau geographic region. Variables were extracted from the Family and Sample-Adult dataset; and used to assess resources and availability of CAM within a community and geographic location.

Need factors. Need data were collected using seven items from the Sample-Adult and Person-level dataset. These included questions related to objective health status and perceived health status. Objective health status included six questions related to chronic health conditions that are prevalent among AAs and Hispanics (e.g., diabetes, chronic liver disease, kidney disease, stroke, cancer, and coronary heart disease). Perceived health status included one question related to reported health status.

Health behaviors. Health related data were collected using four items from the Sample-Adult dataset. These include questions related personal practices an individual does to influence their health status such as: moderate/light leisure-time physical activity, smoking status, alcohol consumption status, and BMI. See Table 3.1 for the NHIS Independent Variables of Interest.

CAM modalities. The NHIS included thirty-two items from the Adult Complementary and Alternative Medicine dataset to assess the use of CAM. However, after combining variables in the dataset, eighteen items remained, including acupuncture, Ayurveda, biofeedback, chelation

therapy, chiropractic or osteopathic manipulation, craniosacral therapy, energy healing therapy, hypnosis, massage, naturopathy, one or more traditional healers, one or more movement therapies, herbal and non-vitamin supplements, vitamin and mineral supplements, homeopathy, one or more special diets, yoga/tai chi and qi gong, and one or more relaxation techniques.

CAM modalities that are provider-directed require a practitioner for care or treatment. Therefore, for CAM modalities that are provider-directed, the item “have you used a practitioner for [fill modality] in the past 12 months” was used. CAM modalities that are products are used by a practitioner but can also be used independently. Therefore, for CAM modalities that are products, the item “have you used [fill modality] in the past 12 months” was used. CAM modalities that are self-directed are used independently without the use of a practitioner. Therefore, for CAM modalities that are self-directed, the item “have you used [fill modality] in the past 12 months” was used.

CAM use. Reported reasons for the top three CAM modalities were collected using four items from the Adult Complementary and Alternative Medicine dataset. Interviewers asked participants if they used CAM modalities for treatment of a specific health problem or if they used CAM modalities to “improve or enhance energy,” “for general wellness or general disease prevention,” or “to improve immune function.” If participants mentioned any of the last three reasons, this was coded as “wellness.” If participants only mentioned wellness for any modalities, this was coded as “wellness only.” If a participant mentioned using treatment for some of the modalities discussed, this was coded as “both wellness and treatment.” If a participant mentioned using any or all modalities as treatment, then this was coded as “treatment only.” Therefore, the outcome measure will be an assessment of the reason for use and coded as wellness only, both treatment and wellness and treatment only (Upchurch & Rainisch, 2015).

Patient disclosure. Patient disclosure for the top three modalities were collected using one item from the Adult Complementary and Alternative Medicine dataset. CAM users were asked, ‘during the past 12 months, did you let your health care provider know about your use of the top three modalities?’ Following methods from Kennedy et al. (2007), patient disclosure was coded dichotomously (disclosure versus non-disclosure) for the top three modalities. Disclosure was defined as (a) 1= used [fill top 3 modalities] in the past 12 months and told their health care provider or (b) 0= used [fill top 3 modalities] in the past 12 months and did not tell their healthcare provider (Kennedy et al., 2007). See Table 3.2 for the NHIS Dependent Variables of Interest.

Table 3.1

NHIS Independent Variables of Interest

Predisposing	
Sex	[Are/Is] [you/person] male or female? 01 Male 02 Female
*Race	Race coded to single/multiple race group 01 White only 02 African American only 03 Other
*Ethnicity	Please give me the number of the group that represents [your/person's] Hispanic origin or ancestry 01 Hispanic 02 Not Hispanic 03 Refused 04 Not ascertained
*Age	Age 01 18-29 years 02 30-39 years 03 40-49 years 04 50-59 years 05 60-69 years 06 70+ years
*Education	Education of adult with highest education in family 01 Less than High School 02 High School 03 More than High School
*Marital Status	[Are/Is] [you/person] now married, widowed, divorced, separated, never married, or living with a partner? 01 Married 02 Widowed/divorced 03 Separated 04 Never married 05 Cohabiting 06 Unknown

*Recoded variable

Enabling	
Conventional Care	DURING THE PAST 12 MONTHS, was there any time when {you/someone in the family} needed medical care, but did not get it because {you/the family} couldn't afford it? 01 Yes 02 No
Insurance Status	Any family members have health insurance coverage? 01 Yes 02 No
Household Income	Total combined family income (grouped) 01 \$0-\$34,999 02 \$35,000-\$74,999 03 \$75,000-\$99,999 04 \$100,000 and over
Geographic Location	Region 01 Northeast 02 Midwest 03 South 04 West

Need	
Perceived	Reported health status 01 Excellent 02 Very good 03 Good 04 Fair 05 Poor
*Evaluated	Number of diagnosed chronic health conditions told by a doctor or other health professional 00 None 01 1-3 chronic health conditions 02 4-6 chronic health conditions

*Recoded variable

Health Behavior	
*Physical Activity	<p>How often do you do LIGHT/MODERATE leisure-time physical activities for AT LEAST 10 MINUTES that cause HEAVY sweating or LARGE increases in breathing or heart rate per week?</p> <p>00 Less than once a week of activity 01 More than once a week of activity 02 No activity</p>
*Alcohol	<p>Alcohol drinking status?</p> <p>01 Lifetime abstainer 02 Former infrequent 03 Current infrequent/light 04 Current moderate/heavy</p>
*Smoking	<p>Do you NOW smoke cigarettes every day, some days or not at all?</p> <p>01 Current every day/some day smoker 02 Former smoker 03 Never smoked</p>
Maintaining a Healthy Body Weight (BMI)	<p>BMI for both men and women:</p> <p>01 <18.5 underweight 02 18.5-24.9 healthy weight 03 25-29.9 overweight 04 > 30 obese</p>

Note. Independent Variables extracted from Sample Adult, Person-level, and Family Files.

*Recoded variable

Table 3.2

NHIS Dependent Variables of Interest

CAM Modalities	
Acupuncture	DURING THE PAST 12 MONTHS, did you see a practitioner for acupuncture? 01 Yes 02 No
Ayurveda	DURING THE PAST 12 MONTHS, did you see a practitioner for ayurveda? 01 Yes 02 No
Biofeedback	DURING THE PAST 12 MONTHS, did use biofeedback? 01 Yes 02 No
Chelation Therapy	DURING THE PAST 12 MONTHS, did you see a practitioner for chelation therapy? 01 Yes 02 No
Chiropractic or osteopathic manipulation	DURING THE PAST 12 MONTHS, did you see a practitioner for chiropractic or osteopathic manipulation? 01 Yes 02 No
Craniosacral Therapy	DURING THE PAST 12 MONTHS, did you see a practitioner for craniosacral therapy? 01 Yes 02 No
Energy Healing	DURING THE PAST 12 MONTHS, did you see a practitioner for energy healing therapy? 01 Yes 02 No
Herbal and Non-Vitamin Supplements	DURING THE PAST 12 MONTHS, have you taken any herbal or other non-vitamin supplements listed on this card for yourself? 01 Yes 02 No
Homeopathy	DURING THE PAST 12 MONTHS, did you see a practitioner for homeopathic treatment for your health? 01 Yes 02 No
Hypnosis	DURING THE PAST 12 MONTHS, did you use hypnosis? 01 Yes 02 No

Massage	DURING THE PAST 12 MONTHS, did you see a practitioner for massage? 01 Yes 02 No
*Movement Therapies	DURING THE PAST 12 MONTHS, did you use Feldenkrais, Alexander Technique, Pilates, or Trager Psychophysical Integration? 01 Yes 02 No
Naturopathy	DURING THE PAST 12 MONTHS, did you see a practitioner for naturopathy? 01 Yes 02 No
*Relaxation Techniques	DURING THE PAST 12 MONTHS, did you use... Mantra meditation (including transcendental meditation, relaxation response, and clinically standardized meditation), Mindfulness meditation (including vipassana, zen buddhist meditation, mindfulness-based stress reduction, and mindfulness-based cognitive therapy), Spiritual meditation (including centering prayer and contemplative meditation), Guided Imagery, or Progressive Relaxation? 01 Yes 02 No
*Special Diets	DURING THE PAST 12 MONTHS, did you use a vegetarian (including vegan) macrobiotic, Atkins, Pritikin, or Ornish diet for two weeks or more for health reasons? 01 Yes 02 No
*Traditional Healers	DURING THE PAST 12 MONTHS, did you see a traditional healer (including Native American Healer, Shaman, Curandero or Parchero, Yerbero or Hiebista, Sobador, Huesero) 01 Yes 02 No
Vitamin and Mineral Supplements	DURING THE PAST 12 MONTHS, did you take multi-vitamins or multi-minerals? 01 Yes 02 No
*Yoga/Tai Chi/Qigong	DURING THE PAST 12 MONTHS, did you practice Yoga, Tai Chi, or Qi gong for yourself? 01 Yes 02 No

*Recoded variable

CAM Use	
*Wellness	<p>Did you {fill1: see a practitioner for/use} {fill2: modality} for any general wellness or general disease prevention, to improve your energy, or to improve your immune function?</p> <p>01 Yes 02 No</p>
Treatment	<p>DURING THE PAST 12 MONTHS, did you {fill1: see a practitioner for/use} {fill2: modality} for one or more specific health problems, symptoms, or conditions?</p> <p>01 Yes 02 No</p>

*Recoded variable

Patient Disclosure	
	<p>DURING THE PAST 12 MONTHS, did you let your personal health care provider know about your use of [fill3: modality]?</p> <p>01 Yes 02 No</p>

Note. Dependent Variables extracted from the Adult-Alternative Medicine Supplement File.

Missing Data

Missing data are a common problem in research (Allison, 2009). Missing data can occur for many reasons, including, participants failing to respond to questions (e.g., outright refusals, irrelevant questions, or do not know the answer), equipment and data collecting methods malfunctioning, or in the case of longitudinal surveys, participants may die or relocate before data can be obtained (Allison, 2009).

The NHIS uses a skip pattern technique in which questions are associated with a conditional response. For example, for all eighteen CAM modalities, participants were asked: ‘have you ever used [fill modality].’ If the respondent replied no, then questions related to the use of the modality in the past 12 months or use of a practitioner in the past 12 months were excluded from data collection. Additionally, the NHIS contained alternative responses to all of the questions (i.e., ‘don’t know,’ ‘not ascertained,’ or ‘refused’). Although these variables contain actual values, the values are outside the normal range (Gerlach & Garra, 2016). Therefore, for the present study, all data responses such as ‘don’t know,’ ‘not ascertained,’ or ‘refused’ were excluded from primary analysis and coded as discrete missing values.

Data Analysis

Data analyses were conducted using the Statistical Packages for Social Sciences version 24 (SPSS Statistics 24). Descriptive statistics were generated on all study variables. Cross-tabulation was the tool used to compare the relationship between variables and log-linear analysis was the technique used to test the relationship between nominal and dichotomous categorical variables. See Table 3.3 for Statistical Analysis Used for Research Questions and Table 3.4 for Research Questions Related to the Dependent and Independent Variables of Interest.

Table 3.3

Statistical Analysis Used for Research Questions

Research Questions	Statistical Analysis
1. Which types of CAM modalities are considered safe and effective, unsafe and effective, neutral, and unsafe and ineffective?	N/A
2. What types of CAM modalities (safe and unsafe) are African-Americans, Hispanics, and Whites using?	Descriptive Statistics, Cross Tabulation
3. What are the top three self-reported CAM modalities used by African-Americans, Hispanics, and Whites?	Descriptive Statistics, Cross Tabulation
4. What factors are associated with patient disclosure to a physician for the top three CAM modalities?	Descriptive Statistics, Three-Dimensional Cross Tabulation
5. What are reported reasons (wellness, treatment, or wellness and treatment) for using the top three CAM modalities among African Americans, Hispanics, and Whites?	Descriptive Statistics, Three-Dimensional Cross Tabulation
6. Which predisposing factors (e.g., age, marital status, education, race, and sex) influence use of CAM?	Descriptive Statistics, Log-linear Analysis
7. Which enabling resources (e.g., household income, current health insurance status, delay in medical care, and US Census Bureau geographic region) influence use of CAM?	Descriptive Statistics, Log-linear Analysis
8. How does perceived health status influence use of CAM?	Descriptive Statistics, Cross Tabulation
9. How does health status evaluated by a health care provider influence use of CAM?	Descriptive Statistics, Cross Tabulation
10. Which individual health behaviors (e.g., smoking status, physical activity, BMI, and alcohol status) influence use of CAM?	Descriptive Statistics, Log-linear Analysis
11. What individual health behaviors, predisposing factors, enabling resources and perceived health status (when combined) influence the use of safe and unsafe CAM modalities?	Descriptive Statistics

Table 3.4
Research Questions Related to the Independent and Dependent Variables of Interest

Research Questions	Independent Variables	Dependent Variables
1. Which types of CAM modalities are considered safe and effective, unsafe and effective, neutral, and unsafe and ineffective?	N/A	N/A
2. What types of CAM modalities (safe and unsafe) are African-Americans, Hispanics, and Whites using?	AA, Hispanic, White	CAM modalities
3. What are the top three self-reported CAM modalities used by African-Americans, Hispanics, and Whites?	AA, Hispanic, White	CAM modalities
4. What factors are associated with patient disclosure to a physician for the top three CAM modalities?	Predisposing, Enabling, Need Factors, and Health Behaviors	Patient-Physician Communication
5. What are reported reasons (wellness, treatment, or wellness and treatment) for using the top three CAM modalities among African Americans, Hispanics, and Whites?	AA, Hispanic, White	CAM modalities (wellness, treatment, or both)
6. Which predisposing factors (e.g., age, marital status, education, race, and sex) influence use of CAM?	Predisposing	CAM modalities
7. Which enabling resources (e.g., household income, current health insurance status, delay in medical care, and US Census Bureau geographic region) influence use of CAM?	Enabling	CAM modalities
8. How does perceived health status influence use of CAM?	Need	CAM modalities
9. How does health status evaluated by a health care provider influence use of CAM?	Need	CAM modalities
10. Which individual health behaviors (e.g., smoking status, physical activity, BMI, and alcohol status) influence use of CAM?	Health Behaviors	CAM modalities
11. What individual health behaviors, predisposing factors, enabling resources and perceived health status (when combined) influence the use of safe and unsafe CAM modalities?	Predisposing, Enabling, Need, and Health behaviors	CAM modalities

Research Questions

Details for data analysis for each research question are listed below:

RQ 1. Which types of CAM modalities are considered safe and effective, unsafe and effective, neutral, and unsafe and ineffective? To determine which CAM modalities were considered safe and effective, unsafe and effective, neutral, and unsafe and ineffective a review of the literature on the 2012 NHIS modalities were conducted using systematic reviews, meta-analyses, and randomized controlled trials from the National Center for Complementary and Integrative Health PubMed database. Additionally, books and publications related to CAM modalities were used. Based on the materials mentioned above, modalities were categorized into Whitney and Rolfes (2016) risks versus benefits chart. CAM therapies should provide benefits with little or no risk. However, some CAM therapies offer little or no benefit for little or no risk, some are dangerous, and some appear to provide benefits, but carry unknown, or debatable risks (Whitney & Rolfes, 2016). See Figure 3.1 Risk-Benefit Relationships.

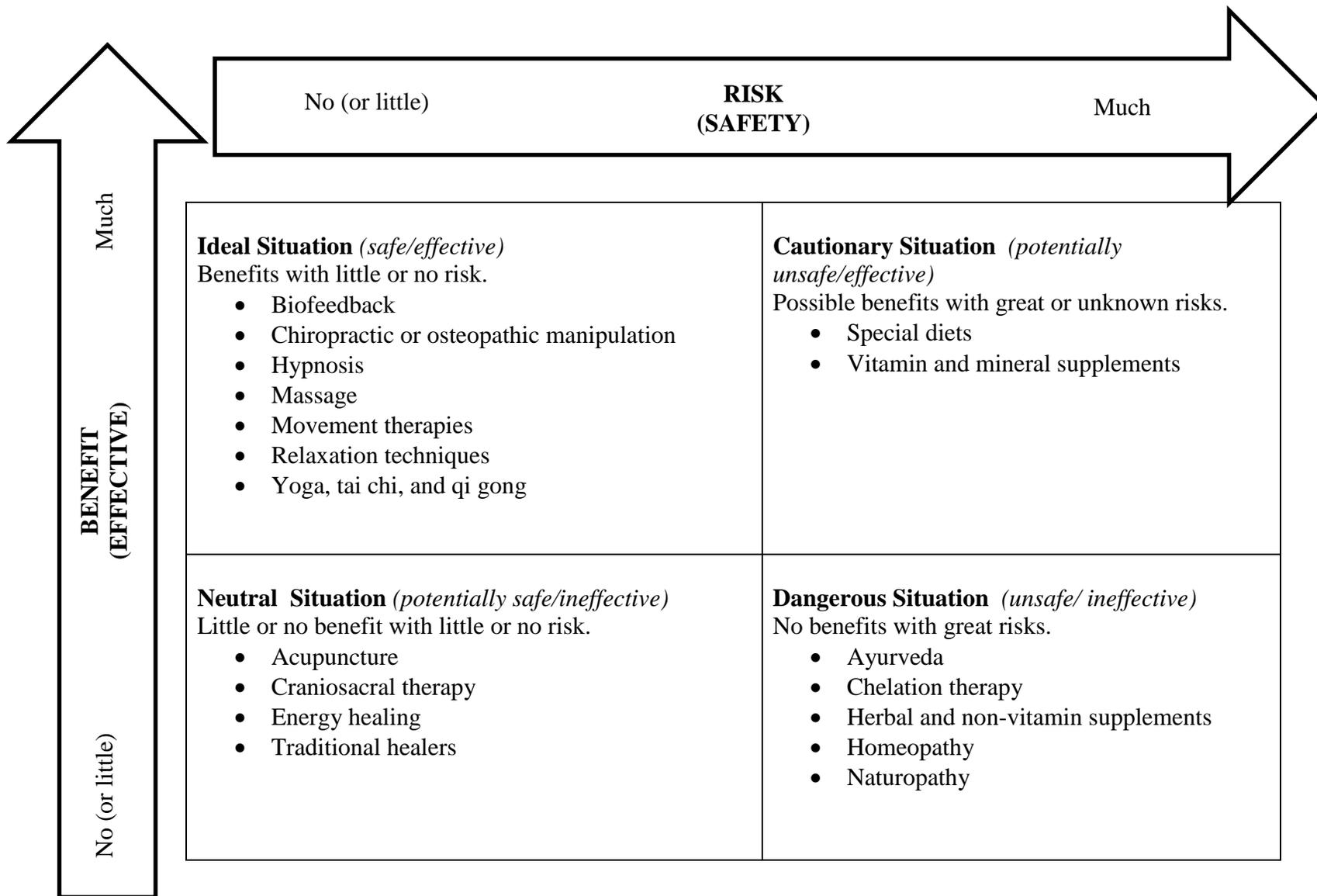


Figure 3.1 Risk-benefit relationships
Note. Adapted from Whitney & Rolfes, 2016.

RQ 2. What types of CAM modalities (safe and unsafe) are African-Americans, Hispanics, and Whites using? Analysis began with descriptive statistics on all CAM modalities. Potentially unsafe and effective and unsafe and ineffective modalities (Ayurveda, chelation therapy, herbal and non-vitamin supplements, homeopathy, naturopathy, special diets, multi-vitamin or mineral supplements) were combined to create a new variable (i.e., unsafe); safe and effective modalities (biofeedback, chiropractic or osteopathic manipulation, hypnosis, massage, movement therapies, relaxation techniques, yoga, tai chi, qi gong) were combined to create a new variable (i.e., safe); and neutral modalities (acupuncture, craniosacral therapy, energy healing, traditional healers) were combined to create a new variable (i.e., neutral). Analysis by cross-tabulation was used to examine the expected count of each modality by race and ethnicity.

RQ 3. What are the top three self-reported CAM modalities used by African- Americans, Hispanics, and Whites? The NHIS excluded Ayurveda, chelation therapy, and vitamins/minerals from the list of top three CAM modalities due to either very high or very low prevalence of use. Additionally, herbal non-vitamin supplements, yoga, tai chi, and qi gong were also excluded from analysis due to the use of the child supplement file to extract pertinent data. Analysis by cross-tabulation was used to determine the next top three CAM modalities used between AAs, Hispanics, and Whites.

RQ 4. What factors are associated with patient disclosure to a physician regarding CAM modalities? The function select all cases in SPSS was used to isolate the top three modalities. Based on the top three modalities used by African Americans, Hispanics, and Whites, three-way cross-tabulation was used to examine factors that are associated with patient disclosure.

RQ 5. What are reported reasons (wellness, treatment, or wellness and treatment) for using the top three CAM modalities among African Americans, Hispanics, and Whites? Based on the top three modalities used by African Americans, Hispanics, and Whites, a three-dimensional cross-tabulation was used to determine the reported reasons for using CAM (wellness, treatment, or both wellness and treatment). To accomplish this, the function select all cases in SPSS was used to isolate the top three modalities. Then, three items for wellness (general wellness or general disease prevention, improve energy, improve immune function) were combined to create one wellness variable, and both treatment and wellness were recoded (0= no, 1= yes). Lastly, three new variables (purpose 1, purpose 2, and purpose 3) were created for each of the top three modalities, in which purpose 1=wellness, purpose 2=treatment, and purpose 3=both treatment and wellness.

RQ 6. Which predisposing factors (e.g., age, marital status, education, race, and sex) influence use of CAM modalities? This study used hierarchical log-linear regression to determine which predisposing factors influence the use of CAM modalities among a national sample of adults. Log-linear analysis is the appropriate technique for testing the relationship between two or more categorical variables (Fisher & Belle, 1996). The Pearson's chi-square p-value for all two-way and three-way interactions were limited to <.001 instead of <.05 due to SPSS recognizing small significant interactions due to the large sample size. Cramér's V was used to test the association between the two categorical variables. Significant two-way interactions were analyzed by using cross-tabulation and three-way interactions were analyzed by creating a graph.

RQ 7. Which enabling resources (e.g., household income, current health insurance status, delay in medical care, and US Census Bureau geographic region) influence use of CAM modalities? Log-linear regression was used to determine which enabling resources influence the use of CAM. Cramér's V was used to test the association between the two categorical variables. Significant two-way interactions were analyzed by using cross-tabulation and three-way interactions were analyzed by creating a graph.

RQ 8. How does perceived health status influence CAM? Cross-tabulation was used to analyze how perceived health status influence the use CAM. Cramér's V was used to test the association between the two categorical variables.

RQ 9. How does health status evaluated by a health care provider influence use of CAM modalities? Cross-tabulation was used to analyze how evaluated health status influence the use of CAM. Cramér's V was used to test the association between the two categorical variables.

RQ 10. Which individual health behaviors (e.g., smoking status, physical activity, BMI, and alcohol status) influence use of CAM? Log-linear regression was used to determine which health behaviors influence the use of CAM modalities. Cramér's V was used to test the association between the two categorical variables. Significant two-way interactions were analyzed by using cross-tabulation and three-way interactions were analyzed by creating a graph.

RQ 11. Which individual health behaviors, predisposing factors, enabling resources and perceived health status (when combined) influence the use of safe and unsafe CAM modalities? A predictive model was created based on significant variables from predisposing, enabling, need, and health behaviors.

CHAPTER 4

RESULTS

The purpose of the present study was to categorize CAM modalities as safe and effective, safe and ineffective, neutral, and unsafe and ineffective, to examine the use of safe and unsafe CAM therapies among a national sample of adults, and to explore factors that enable or encourage the use of CAM and patient disclosure for the top three self-reported CAM modalities. Additionally, this study determined which predisposing, enabling, need, and health behavior practices were related to CAM use among a national sample of adults. All analyses were performed using SPSS Version 24 with a *priori* alpha level of $<.001$.

Study Sample

The interview sample for the 2012 NHIS consisted of 42,366 households, which yielded 108,131 persons in 43,345 families. The interviewed sample for the Sample-Adult component was 34,525, and the total household response rate was 78%. Approximately 15% of those who were not interviewed resulted from refusal and/or unacceptable partial interviews. The remaining 8% was the result of failure to locate an eligible respondent at home after repeated attempts (CDC/NCHS, National Health Interview Survey, 2012).

The conditional response rate for the Family component was 99%. This was calculated by dividing the number of completed family interviews (43,345) by the total number of eligible families (43,785) (CDC/NCHS, National Health Interview Survey, 2012).

The unconditional (or final) response rate for the family component was 77%, which was calculated by multiplying the conditional rate by the household response rate, which yielded a rate of 77%. The conditional response rate for the Sample-Adult component was 80%. This was calculated by dividing the number of completed interviews (34,525) by the total number of eligible sample adults (43,323) (CDC/NCHS, National Health Interview Survey, 2012). The unconditional (or final) response rate was calculated by multiplying the conditional rate by the final family response rate, which yielded a rate of 61%.

Sample Characteristics

The adult response for the 2012 NHIS sample was 34,525. As shown in Table 4.1, 75% ($n= 25,939$) of participants identified as White, 15% ($n= 5,319$) identified as AA, and 17% ($n= 5,859$) identified as Hispanic. Fifty-six percent ($n= 19,252$) of participants were females, 67% ($n= 23,130$) reported at least one adult in the family received more than a high school education, 43% ($n= 14,930$) were married, and the average age of participants was 49 years old ($M=48.53$, $SD=18.165$).

Table 4.1

Distributions of the Predisposing Variables of Interest Among a National Sample of Adults (N=34,525)

Predisposing	Frequency (n)	Valid Percent (%)
<u>Race</u>		
White	25939	75.1
African American	5319	15.4
Other	3267	9.5
<u>Ethnicity</u>		
Hispanic	5859	17.0
Not Hispanic	28666	83.0
<u>Age</u>		
18-29	6420	18.6
30-39	6014	17.4
40-49	5731	16.6
50-59	6091	17.6
60-69	5193	15.0
70+	5076	14.7
<u>Sex</u>		
Male	15273	44.2
Female	19252	55.8
<u>Education</u>		
Less than High School	1280	3.7
High School	10047	29.2
More than High School	23130	67.1
Missing [Refused, Don't know]	68	
<u>Marital Status</u>		
Married	14930	43.3
Divorced/Widowed	8083	23.5
Separated	1041	3.0
Never Married	8270	24.0
Cohabiting	2123	6.2
Missing [Unknown Marital Status]	78	

Note. Some predictors do not add up to total sample due to missing values.

Table 4.2 displays the enabling variables of interest. Out of the 34,525 participants included in analysis, 36% ($n=12,536$) of the sample resided in the South, 44% ($n=14,352$) reported the total combined family income was \leq \$34,999, 91% ($n=31,235$) reported a family member had insurance, and 17% ($n=5,868$) delayed medical care because of cost.

Table 4.2

Distributions of the Enabling Variables of Interest Among a National Sample of Adults (N=34,525)

Enabling	Frequency (n)	Valid Percent (%)
<u>Region</u>		
Northeast	5774	16.7
Midwest	7193	20.8
South	12536	36.3
West	9022	26.1
<u>Income</u>		
\$0-34,999	14352	44.0
\$35,000-74,999	9918	30.4
\$75,000-99,999	3250	10.0
\$100,000 and over	5079	15.6
Missing [Undefined/Unknown]	1926	
<u>Insurance</u>		
Yes	31235	90.6
No	3236	9.4
Missing [Refused, Not ascertained, Don't know]	54	
<u>Medical Care Delayed Due to</u>		
<u>Cost</u>		
Yes	5868	17.0
No	28650	83.0
Missing [Refused, Not ascertained, Don't know]	7	

Note. Some predictors do not add up to total sample due to missing values.

The distributions of the need variables of interest are displayed in Table 4.3. Out of the 34,525 participants included in this analysis, 26% ($n= 8,858$) reported excellent health, 59% ($n= 20,380$) reported very good and/or good health, 16% ($n= 5,269$) reported fair and/or poor health, and 23% ($n= 8,004$) of participants were diagnosed with 1-3 health conditions by a health care provider.

Table 4.3

Distributions of the Need Variables of Interest Among a National Sample of Adults (N=34,525)

Need	Frequency (n)	Valid percent (%)
<u>Perceived</u>		
Excellent	8858	25.7
Very Good	10744	31.1
Good	9636	27.9
Fair	3999	11.6
Poor	1270	3.7
Missing [Refused, Not ascertained, Don't know]	18	
<u>Evaluated (Diagnosed by a health care provider)</u>		
None	26521	76.8
1-3 health conditions	8004	23.2
4-6 health conditions	0	0

Note. Some predictors do not add up to total sample due to missing values.

Table 4.4 includes the self-reported health behaviors and calculated BMI values from self-reported heights and weights. For participants reporting health information, 42% ($n= 14,267$) of the sample were current infrequent/light drinkers, 59% ($n= 20,236$) reported they never smoked, 64% ($n= 20,444$) had a BMI classified as overweight or obese (greater than or equal to 25), and 56% ($n= 19,021$) engaged in more than once a week of light/moderate physical activity per week.

Table 4.4

Distributions of the Health Behavior Variables of Interest Among a National Sample of Adults (N=34,525)

Health Behaviors	Frequency (n)	Valid percent (%)
<u>Alcohol Status</u>		
Lifetime abstainer	7451	22.0
Former	5400	16.0
Current infrequent/light	14267	42.2
Current moderate heavy	6675	19.8
Missing [current drinker frequency unknown/Drinking status unknown]	732	
<u>Smoking Status</u>		
Current	6436	18.8
Former	7584	22.1
Never smoked	20236	59.1
Missing [Smoker, current status unknown/ Unknown if ever smoked]	269	
<u>Body Mass Index</u> (calculated from self-reported heights and weights)		
<18.5	577	1.8
18.5-24.9	11290	34.9
25-29	9516	29.5
>30	10928	33.8
Missing	2214	
<u>Physical Activity</u>		
Less than once a week	706	2.1
More than once a week	19021	56.3
No activity	14079	41.6
Missing [Refused/Not ascertained/Don't know]	719	

Note. Some predictors do not add up to total sample due to missing values.

Research Questions

RQ 1. Which types of CAM modalities are considered safe and effective, unsafe and effective, neutral, and unsafe and ineffective?

As shown in Figure 3.1, safe and effective modalities included biofeedback, chiropractic or osteopathic manipulation, hypnosis, massage, movement therapies, relaxation techniques, and yoga, tai chi, and qi gong. Neutral modalities included acupuncture, craniosacral therapy, energy healing, and traditional healers. Potentially unsafe and effective modalities included special diets and vitamin and mineral supplements; and unsafe and ineffective modalities included ayurveda, chelation therapy, herbal and non-vitamin supplements, homeopathy, and naturopathy.

RQ 2. What types of CAM modalities (safe and unsafe) are African-Americans, Hispanics, and Whites using?

As shown in Table 4.5, 26% ($n= 9,592$) of White participants, 10% ($n= 1,049$) of AA participants, and 12% ($n= 1,414$) of Hispanic participants reported using safe therapies. Eighteen percent ($n= 6,967$) of females stated that they used therapies in the safe category compared to 16% ($n= 4,831$) of males. Twenty percent ($n= 2,026$) of participants aged 60 to 69 responded that they used safe therapies compared to 15% ($n=1,869$) of participants aged 18 to 29 and 15% ($n= 1,552$) of participants aged 70 or older. Twenty percent ($n= 9,176$) who reported at least one adult in the family received more than a high school education reported using safe therapies. Eighteen percent ($n= 5,518$) of participants who were married and 18% ($n= 2,832$) of participants who were divorced or widowed stated that they used safe therapies compared to 14% ($n= 295$) of participants who were separated. Twenty-three percent ($n= 2,273$) of participants who reported a yearly income of $\geq \$100,000$ said they used safe therapies compared to 14% ($n= 4,005$) of participants who reported a yearly income of $\leq \$34,999$. Twenty-one percent ($n=$

3,697) of participants who lived in the West indicated that they used safe therapies compared to 13% ($n= 3,366$) of participants who lived in the South. Seventeen percent ($n= 10,840$) of participants who reported a family member had insurance reported that they used safe therapies.

Forty-nine percent ($n= 18,291$) of White participants, 29% ($n= 3,088$) of AA and 29% ($n= 3,345$) of Hispanic participants responded that they used unsafe therapies. Thirty-six percent ($n= 13,776$) of females said they used unsafe therapies compared to 32% ($n= 9,788$) of males. Fifty-five percent ($n= 4,335$) of participants aged 50 to 59 years stated that they used unsafe therapies compared to 32% ($n= 4,066$) of participants aged 18 to 29 years. Thirty-seven percent ($n= 17,147$) of participants who reported at least one adult in the family received more than a high school education conveyed that they used unsafe therapies. Thirty-six percent ($n= 10,549$) of participants who were married replied that they used unsafe therapies compared to 30% ($n= 623$) of participants who were separated. Forty percent ($n= 4,043$) of participants who reported a yearly income of $\geq \$100,000$ claimed that they used unsafe therapies compared to 31% ($n= 8,773$) of participants who reported a yearly income of $\leq \$34,999$. Thirty-eight percent ($n= 6,709$) of participants who lived in the West used reported using unsafe therapies compared to 32% ($n= 7,986$) of participants who lived in the South. Thirty-five percent ($n= 21,627$) of participants who reported a family member had insurance revealed that they used unsafe therapies.

Table 4.5

Sociodemographic Determinants of Safe and Unsafe CAM Modalities Among a National Sample of Adults (N=34,525)

	Safe	Unsafe	Non-Use	P value
<u>Race</u>				<.001
White	9592 (26%)	18291 (49%)	9213 (25%)	
African American	1049 (10%)	3088 (29%)	6473 (61%)	
Other	1157 (7%)	2185 (13%)	13006 (80%)	
<u>Ethnicity</u>				<.001
Hispanic	1414 (12%)	3345 (29%)	6930 (59%)	
Not Hispanic	10384 (18%)	20219 (36%)	26260 (46%)	
<u>Sex</u>				<.001
Male	4831 (16%)	9788 (32%)	15789 (52%)	
Female	6967 (18%)	13776 (36%)	17401 (46%)	
<u>Age</u>				<.001
18-29	1869 (15%)	4066 (32%)	6867 (54%)	
30-39	2083 (17%)	4059 (34%)	5819 (49%)	
40-49	2032 (18%)	3842 (34%)	5493 (48%)	
50-59	2236 (19%)	4335 (55%)	5457 (45%)	
60-69	2026 (20%)	3760 (37%)	4486 (44%)	
70+	1552 (15%)	3502 (35%)	5088 (50%)	
<u>Education</u>				<.001
Less than HS	246 (10%)	621 (24%)	1692 (66%)	
High School	2367 (12%)	5762 (29%)	11926 (59%)	
More than HS	9176 (20%)	17147 (37%)	19479 (43%)	
<u>Marital Status</u>				<.001
Married	5518 (18%)	10549 (36%)	13610 (46%)	
Divorced/Widowed	2832 (18%)	5676 (35%)	7498 (47%)	
Separated	295 (14%)	623 (30%)	1153 (56%)	
Never Married	2446 (15%)	5251 (32%)	8731 (53%)	
Cohabiting	682 (16%)	1417 (34%)	2155 (50%)	
<u>Income</u>				<.001
\$0-34,999	4005 (14%)	8773 (31%)	15765 (55%)	
\$35,000-74,999	3582 (18%)	7058 (36%)	9037 (46%)	
\$75,000-99,999	1343 (21%)	2451 (38%)	2647 (41%)	
\$100,000 and over	2273 (23%)	4043 (40%)	3738 (37%)	

<u>Region</u>				<.001
Northeast	1913 (17%)	3858 (34%)	5681 (49%)	
Midwest	2822 (20%)	5011 (35%)	6475 (45%)	
South	3366 (13%)	7986 (32%)	13624 (55%)	
West	3697 (21%)	6709 (38%)	7410 (41%)	
<u>Insurance</u>				<.001
Yes	10840 (17%)	21627 (35%)	29569 (48%)	
No	945 (15%)	1903 (30%)	3560 (55%)	

*p <.001 due to large sample size and multiple testing

Note. Some participants may use multiple safe or unsafe modalities. *P*-value examined the statistical difference between the frequency of safe, unsafe and non-use CAM modalities in each category.

RQ 3. What are the top three self-reported CAM modalities used by African- Americans, Hispanics, and Whites?

The NHIS excluded Ayurveda, chelation therapy, and vitamins/minerals from the list of top three CAM modalities due to either very high or very low prevalence of use. Additionally, herbal non-vitamin supplements, yoga, tai chi, and qi gong were also excluded from analysis due to the use of the child supplement file to extract pertinent data. Therefore, the top three self-reported CAM modalities used among racial and ethnic groups were chiropractic or osteopathic manipulation, massage, and special diets. (See Tables 4.6, 4.7 and 4.8 for frequency distributions and usage rates on the top three therapies.)

The overall self-reported usage rate for chiropractic or osteopathic manipulation (in Table 4.6) was equal to 2,546/34,525, or 7%. Chiropractic or osteopathic manipulation rates among Whites was equal to 2,248/2546, or 9%. Chiropractic or osteopathic manipulation rates among AAs was equal to 136, or 3% and 245, or 4% for Hispanics. The rate of chiropractic or osteopathic manipulation among females was 2,301, or 8% and 1,053, or 7% for males. Three hundred fifty-nine, or 6% of participants aged 18 to 29 years and 319, or 6% of participants aged 70 or more years reported chiropractic or osteopathic manipulation as the first top therapy

compared to 498, or 9% of participants aged 40 to 49. The rate of chiropractic or osteopathic manipulation reported use among participants who received less than a high school education was 42, or 3% compared to 1,962, or 8% of participants who received more than a high school education. One thousand nine, or 9% of participants who were married reported the modality as the first top therapy compared to 54, or 5% of participants who were separated and 451, or 5% of participants who were never married. Chiropractic or osteopathic manipulation rates among participants who reported a yearly income of \$75,000-\$99,999 was 335, or 10% compared to participants who reported a yearly income of \leq \$34,999 which was equal to 711, or 5%. Rates of the modality for participants who lived in the Midwest was equal to 811, or 11% compared to participants who lived in the South which was equal to 639, or 5%. Two thousand three hundred ninety-eight, or 8% of participants who had insurance reported chiropractic or osteopathic manipulation as the first top therapy.

Of the 2,546 participants who reported using chiropractic or osteopathic manipulation, 59% ($n=1,493$) were females, 88% ($n= 2,248$) identified as White, 5% ($n= 136$) identified as AA, and 10% ($n= 245$) identified as Hispanic. Twenty percent ($n=498$) were aged 40 to 49, 77% ($n= 1,962$) reported at least one adult in the family received more than a high school education, 52% ($n= 1,309$) were married, 36% ($n= 865$) reported a yearly income of \$35,000-74,999, 32% ($n= 811$) lived in the Midwest, and 94% ($n= 2,398$) had insurance.

Table 4.6

Distributions of the First Self-Reported Most Used CAM Among a National Sample of Adults (N=2546)

Chiropractic or Osteopathic Manipulation	Frequency (<i>n</i>)	Usage Rates	<i>P</i> Value
<u>Race</u>			
White	2248	(9%)	<.001
African American	136	(3%)	
Other	162	(5%)	
<u>Ethnicity</u>			
Hispanic	245	(4%)	<.001
Not Hispanic	2301	(8%)	
<u>Sex</u>			
Male	1053	(7%)	<.001
Female	1493	(8%)	
<u>Age</u>			
18-29	359	(6%)	<.001
30-39	461	(8%)	
40-49	498	(9%)	
50-59	476	(8%)	
60-69	433	(8%)	
70+	319	(6%)	
<u>Education</u>			
Less than HS	42	(3%)	<.001
High School	541	(5%)	
More than HS	1962	(8%)	
<u>Marital Status</u>			
Married	1309	(9%)	<.001
Divorced/Widowed	602	(7%)	
Separated	54	(5%)	
Never Married	451	(5%)	
Cohabiting	127	(6%)	
<u>Income</u>			
\$0-34,999	711	(5%)	<.001
\$35,000-74,999	865	(9%)	
\$75,000-99,999	335	(10%)	
\$100,000 and over	505	(9%)	
<u>Region</u>			
Northeast	381	(7%)	<.001
Midwest	811	(11%)	
South	639	(5%)	
West	715	(8%)	

<u>Insurance</u>			<.001
Yes	2398	(8%)	
No	146	(5%)	

Note. Some predictors do not add up to total sample due to missing values. *P*-value examined the statistical difference between the frequency of the first self-reported most used CAM in each category and overall frequency for each category.

The overall self-reported usage rate for the second top therapy (see Table 4.7) was equal to 609, or 2%. Massage rates among Whites were equal to 520, or 2%. Massage rates among AAs were 42, or 1% and 67, or 1% for Hispanics. The rate of massage among females was 398, or 3% compared to 211, or 1% of males. One hundred thirty nine, or 2% of participants aged 30-39, 135, or 2% of participants aged 40 to 49, and 129, or 2% of participants aged 50 to 59 reported massage as the second top therapy compared to 89, or 1% of participants aged 18 to 29, 76, or 1% of participants aged 60 to 69, and 41, or 1% of participants aged 70 or older. The rate of massage among participants who received less than a high school education was 8, or 1% and participants who received a high school education was equal to 81, or 1% compared to 520, or 2% of participants who received more than a high school education. The rate of massage among participants who were separated was 12, or 1%. Massage rates among participants who reported a yearly income of \$75,000-99,999 were equal to 100, or 3% and participants who reported a yearly income of \geq \$100,000 was 145, or 3% compared to participants who reported a yearly income of \leq \$34,999 which was equal to 147, or 1%. Rates of the modality for participants who lived in the Midwest was equal to 161, or 2% and participants who lived in the West was 214, or 2% compared to participants who lived in the South which was equal to 155, or 1% and participants who lived in the Northeast, which was 79, or 1%. Five hundred sixty-three, or 2% of participants who had insurance reported massage as the second top therapy.

Out of the 609 participants who used massage, 65% ($n= 398$) were females, 85% ($n= 520$) identified as White, 7% ($n= 42$) identified as AA, and 11% ($n= 67$) identified as Hispanic. Twenty three percent of the sample ($n= 139$) were aged 30 to 39, 85% ($n=520$) reported at least one adult in the family received more than a high school education, 47% ($n=287$) were married, 33% ($n=196$) reported a yearly income of \$35,000-74,999, 35% ($n=214$) lived in the West, and 93% ($n= 563$) had insurance.

Table 4.7

Distributions of the Second Self-Reported Most Used CAM Among a National Sample of Adults (N=609)

Massage	Frequency (n)	Usage Rates	P Value
<u>Race</u>			<.001
White	520	(2%)	
African American	42	(1%)	
Other	47	(1%)	
<u>Ethnicity</u>			<.001
Hispanic	67	(1%)	
Not Hispanic	542	(2%)	
<u>Sex</u>			<.001
Male	211	(1%)	
Female	398	(3%)	
<u>Age</u>			<.001
18-29	89	(1%)	
30-39	139	(2%)	
40-49	135	(2%)	
50-59	129	(2%)	
60-69	76	(1%)	
70+	41	(1%)	
<u>Education</u>			<.001
Less than HS	8	(1%)	
High School	81	(1%)	
More than HS	520	(2%)	
<u>Marital Status</u>			<.001
Married	287	(2%)	
Divorced/Widowed	146	(2%)	
Separated	12	(1%)	
Never Married	130	(2%)	
Cohabiting	34	(2%)	
<u>Income</u>			<.001
\$0-34,999	147	(1%)	
\$35,000-74,999	196	(2%)	
\$75,000-99,999	100	(3%)	
\$100,000 and over	145	(3%)	
<u>Region</u>			<.001
Northeast	79	(1%)	
Midwest	161	(2%)	
South	155	(1%)	
West	214	(2%)	

<u>Insurance</u>			<.001
Yes	563	(2%)	
No	46	(1%)	

Note. Some predictors do not add up to total sample due to missing values. *P*-value examined the statistical difference between the frequency of the second self-reported most used CAM in each category and overall frequency for each category.

The overall self-reported usage rate for the third top therapy (see Table 4.7) was 1%. Special diet rates among Whites was equal to 182, or 1%. Massage rates among AAs were 20, or 0% and 26, or 0% for Hispanics. The rate of massage among females was 146, or 1% and 85, or 1% for males. Nine, or 0% of participants aged 70 or older reported special diets as the third top therapy. The rate of massage among participants who received more than a high school education was 207, or 1% compared to 2, or 0% of participants who received less than a high school education and 22, or 0% of participants who received a high school education. Ninety-one, or 1% of participants who were married, 54, or 1% who were divorced or widowed, 6, or 1% who were separated, 60, or 1% who were never married, and 19, or 1% who were cohabitating reported the modality as the third top therapy. Seventy four, or 1% of participants who reported a yearly income of \leq \$34,999, 75, or 1% of participants who reported a yearly income of \$35,000-74,999, 25, or 1% of participants who reported a yearly income of \$75,000-99,999, and 46, or 1% of participants who reported a yearly income of \geq \$100,000 reported the use of the modality as the third top therapy. Rates of the modality for participants who lived in the South was equal to 61, or 0%, and 212, or 1% of participants who had insurance reported special diets as the third top therapy.

Out of the 231 participants who stated that they used special diets (Table 4.8), 63% ($n=146$) were female, 79% ($n= 182$) identified as White, 9% ($n= 20$) identified as AA, and 11%

($n= 26$) identified as Hispanic. Twenty-seven percent ($n= 62$) were aged 50 to 59, 90% ($n= 2017$) reported at least one adult in the family received more than a high school education, 40% ($n= 91$) were married, 34% ($n= 149$) reported a yearly income of $\leq \$74,999$, 34% ($n= 78$) lived in the West, and 92% ($n= 212$) had insurance.

Table 4.8

Distributions of the Third Self-Reported Most Used CAM Among a National Sample of Adults (N=231)

Special Diets	Frequency (n)	Usage Rates	P Value
<u>Race</u>			<.001
White	182	(1%)	
African American	20	(0%)	
Other	29	(1%)	
<u>Ethnicity</u>			<.001
Hispanic	26	(0%)	
Not Hispanic	205	(1%)	
<u>Sex</u>			<.001
Male	85	(1%)	
Female	146	(1%)	
<u>Age</u>			<.001
18-29	38	(1%)	
30-39	42	(1%)	
40-49	41	(1%)	
50-59	62	(1%)	
60-69	39	(1%)	
70+	9	(0%)	
<u>Education</u>			<.001
Less than HS	2	(0%)	
High School	22	(0%)	
More than HS	207	(1%)	
<u>Marital Status</u>			<.001
Married	91	(1%)	
Divorced/Widowed	54	(1%)	
Separated	6	(1%)	
Never Married	60	(1%)	
Cohabiting	19	(1%)	
<u>Income</u>			<.001
\$0-34,999	74	(1%)	
\$35,000-74,999	75	(1%)	
\$75,000-99,999	25	(1%)	
\$100,000 and over	46	(1%)	
<u>Region</u>			<.001
Northeast	41	(1%)	
Midwest	51	(1%)	
South	61	(0%)	
West	78	(1%)	

<u>Insurance</u>			<.001
Yes	212	(1%)	
No	19	(1%)	

Note. Some predictors do not add up to total sample due to missing values. *P*-value examined the statistical difference between the frequency of the third self-reported most used CAM in each category and overall frequency for each category.

RQ 4. What factors are associated with patient disclosure to a physician regarding CAM modalities?

As shown in table 4.9, 67% (*n*= 63) of AA participants, 61% (*n*= 1,076) of White participants, and 60% (*n*= 95) of Hispanic participants disclosed the use of chiropractic or osteopathic manipulation to a health care provider. Sixty-three percent (*n*= 750) of females disclosed the use of the modality to a health care provider compared to 60% (*n*= 465) of males. Sixty-eight percent (*n*= 248) of participants aged 60 to 69 years and 64% (*n*= 201) of participants who were never married disclosed the use of the modality. Seventy-three percent (*n*= 19) of participants that reported a family member received less than a high school education and 65% (*n*= 339) who reported a yearly income of ≤\$34,999 disclosed the use of the modality. Sixty-six percent (*n*= 209) of the sample that lived in the Northeast and 62% (*n*= 1,172) of participants who reported a family member had insurance disclosed the use of the chiropractic or osteopathic manipulation to a health care provider.

Table 4.9

Distributions of the First Most Used CAM and Patient Disclosure Among a National Sample of Adults (N=1971)

Chiropractic or Osteopathic Manipulation	Frequency (n)	Disclosed Use of CAM	P Value
<u>Race</u>			<.001
White	1759	1076 (61%)	
African American	94	63 (67%)	
Other	118	76 (64%)	
<u>Ethnicity</u>			<.001
Hispanic	158	95 (60%)	
Not Hispanic	1813	1120 (62%)	
<u>Sex</u>			<.001
Male	771	465 (60%)	
Female	1200	750 (63%)	
<u>Age</u>			<.001
18-29	234	137 (59%)	
30-39	319	183 (57%)	
40-49	382	217 (57%)	
50-59	397	252 (63%)	
60-69	363	248 (68%)	
70+	276	178 (64%)	
<u>Education</u>			<.001
Less than HS	26	19 (73%)	
High School	404	243 (60%)	
More than HS	1540	952 (62%)	
<u>Marital Status</u>			<.001
Married	1048	646 (62%)	
Divorced/Widowed	488	298 (61%)	
Separated	36	21 (58%)	
Never Married	314	201 (64%)	
Cohabiting	83	48 (58%)	
<u>Income</u>			<.001
\$0-34,999	520	339 (65%)	
\$35,000-74,999	662	398 (60%)	
\$75,000-99,999	269	167 (62%)	
\$100,000 and over	420	245 (58%)	
<u>Region</u>			<.001
Northeast	317	209 (66%)	
Midwest	640	371 (58%)	
South	476	306 (64%)	
West	538	329 (61%)	

<u>Insurance</u>			<.001
Yes	1894	1172 (62%)	
No	76	42 (55%)	

Note. Some participants may use multiple safe or unsafe modalities. *P*-value examined the statistical difference between the frequency of the first most used CAM in each category and frequency of disclosed use of CAM for each category.

As shown in Table 4.10, 68% (*n*= 19) of AA participants, 47% (*n*= 187) of White participants, and 57% (*n*= 24) of Hispanic participants disclosed the use of massage to a health care provider. Forty-eight percent (*n*= 71) of male participants reported the use of the modality compared to 47% (*n*= 148) of females. Sixty-three percent (*n*= 31) of participants aged 50 to 69 years disclosed the use of massage to a health care provider. Forty-eight percent (*n*= 192) of participants who reported a family member received more than a high school education and 74% (*n*= 5) of the sample who were separated disclosed the use of the modality. Forty-eight percent (*n*= 142) of participants who reported a yearly income of ≤34,999 and \$75,000-\$99,999 disclosed the use of massage to a health care provider. Fifty-five percent (*n*= 63) of the sample who lived in the South and 47% (*n*= 208) of participants who reported a family member had insurance disclosed the use of massage to a health care provider.

Table 4.10

Distributions of the Second Most Used CAM and Patient Disclosure Among a National Sample of Adults (N=461)

Massage	Frequency (n)	Disclosed Use of CAM	P Value
<u>Race</u>			<.001
White	397	187 (47%)	
African American	28	19 (68%)	
Other	36	13 (33%)	
<u>Ethnicity</u>			<.001
Hispanic	42	24 (57%)	
Not Hispanic	419	195 (47%)	
<u>Sex</u>			<.001
Male	148	71 (48%)	
Female	313	148 (47%)	
<u>Age</u>			<.001
18-29	60	30 (50%)	
30-39	90	39 (43%)	
40-49	104	48 (46%)	
50-59	108	52 (63%)	
60-69	62	31 (63%)	
70+	37	19 (39%)	
<u>Education</u>			<.001
Less than HS	4	1 (25%)	
High School	57	26 (46%)	
More than HS	400	192 (48%)	
<u>Marital Status</u>			<.001
Married	227	101 (44%)	
Divorced/Widowed	112	54 (48%)	
Separated	7	5 (74%)	
Never Married	90	50 (56%)	
Cohabiting	25	9 (36%)	
<u>Income</u>			<.001
\$0-34,999	102	71 (48%)	
\$35,000-74,999	155	148 (47%)	
\$75,000-99,999	76	71 (48%)	
\$100,000 and over	112	148 (47%)	
<u>Region</u>			<.001
Northeast	66	33 (50%)	
Midwest	127	48 (38%)	
South	114	63 (55%)	
West	154	75 (49%)	

<u>Insurance</u>			<.001
Yes	440	208 (47%)	
No	21	11 (52%)	

Note. Some predictors do not add up to total sample due to missing values. *P*-value examined the statistical difference between the frequency of the second most used CAM in each category and frequency of disclosed use of CAM for each category.

As shown in Table 4.11, 29% ($n= 38$) of White participants, 23% ($n= 3$) of AA participants, and 40% ($n= 6$) of Hispanic participants did not disclose the use of special diets to a health care provider. Thirty-six percent ($n= 18$) of male participants did not disclose the modality compared to 26% ($n= 28$) of female participants. Forty-one percent ($n= 11$) of participants aged 40 to 49 did not disclose the use of the modality to a health care provider. Twenty-nine percent ($n= 42$) of participants who reported a family member received more than a high school education and 43% ($n= 8$) who were separated did not disclose the use of the modality. Thirty-eight percent ($n= 20$) of participants who reported a yearly income of \$35,000 to \$74,999 did not disclose the modality. Forty-one percent ($n= 13$) of participants who lived in the Northeast and 28% ($n= 44$) of participants who reported a family member had insurance did not disclose the use of special diets to a health care provider.

Table 4.11

Distributions of the Third Most Used CAM and Patient Disclosure Among a National Sample of Adults (N=163)

Special Diets	Frequency (n)	Disclosed Use of CAM	P Value
<u>Race</u>			<.001
White	130	92 (71%)	
African American	13	10 (77%)	
Other	20	15 (75%)	
<u>Ethnicity</u>			<.001
Hispanic	15	9 (60%)	
Not Hispanic	148	108 (73%)	
<u>Sex</u>			<.001
Male	57	39 (64%)	
Female	106	78 (74%)	
<u>Age</u>			<.001
18-29	24	15 (63%)	
30-39	26	18 (69%)	
40-49	27	16 (59%)	
50-59	46	38 (83%)	
60-69	33	25 (76%)	
70+	7	5 (71%)	
<u>Education</u>			<.001
Less than HS	1	1 (1%)	
High School	18	14 (78%)	
More than HS	144	102 (71%)	
<u>Marital Status</u>			<.001
Married	69	49 (71%)	
Divorced/Widowed	41	35 (85%)	
Separated	4	4 (1%)	
Never Married	34	20 (59%)	
Cohabiting	14	8 (57%)	
<u>Income</u>			<.001
\$0-34,999	46	37 (80%)	
\$35,000-74,999	53	33 (62%)	
\$75,000-99,999	17	15 (88%)	
\$100,000 and over	39	26 (67%)	
<u>Region</u>			<.001
Northeast	32	19 (59%)	
Midwest	39	31 (79%)	
South	44	33 (75%)	
West	48	34 (71%)	

<u>Insurance</u>			<.001
Yes	158	114 (72%)	
No	5	3 (60%)	

Note. Some predictors do not add up to total sample due to missing values. *P*-value examined the statistical difference between the frequency of the third most used CAM in each category and frequency of disclosed use of CAM for each category.

RQ 5. What are reported reasons (wellness, treatment, or wellness and treatment) for using the top three CAM modalities among African Americans, Hispanics, and Whites?

Regarding reported reasons for the top three therapies, 47% of White participants, 47% of AA participants, and 49% of Hispanic participants used chiropractic or osteopathic manipulation for wellness only. Thirty-eight percent of White participants, 40% of AA participants, and 39% of Hispanic participants used this therapy for treatment only. Fifteen percent of White participants, 13% of AA participants, and 12% of Hispanic participants used this therapy for both wellness and treatment.

Thirty-one percent of White participants, 32% of AA participants, and 19% of Hispanic participants used massage therapy for wellness only. Thirty-six percent of White participants, 45% of AA participants, and 33% of Hispanic participants used this therapy for treatment only. Thirty-three percent of White participants, 23% of AA participants, and 49% of Hispanic participants used this therapy for both wellness and treatment.

Sixty-two percent of White participants, 25% of AA participants, and 40% of Hispanic participants used special diets for wellness only. Sixteen percent of White participants, 50% of AA participants, and 20% of Hispanic participants used this therapy for treatment only. Twenty-two percent of White participants, 25% of AA participants, and 40% of Hispanic participants used this therapy for both wellness and treatment.

Table 4.12

Top Therapies and Reasons for Use by Race and Ethnicity Among a National Sample of Adults

	Wellness	Treatment	Both	<i>P</i> value
Chiropractic or Osteopathic Manipulation (N= 2546)				
<u>Race</u>				<.001
White	1148 (47%)	921 (38%)	372 (15%)	
African American	77 (47%)	65 (40%)	22 (13%)	
Other	87 (50%)	66 (38%)	21 (12%)	
<u>Ethnicity</u>				<.001
Hispanic	121 (49%)	97 (39%)	31 (12%)	
Not Hispanic	1191 (47%)	955 (38%)	384 (15%)	
Massage (N=609)				
<u>Race</u>				<.001
White	83 (31%)	97 (36%)	90 (33%)	
African American	7 (32%)	10 (45%)	5 (23%)	
Other	4 (18%)	11 (50%)	7 (32%)	
<u>Ethnicity</u>				<.001
Hispanic	7 (19%)	12 (33%)	18 (49%)	
Not Hispanic	87 (31%)	106 (32%)	84 (30%)	
Special Diets (N=231)				
<u>Race</u>				<.001
White	28 (62%)	7 (16%)	10 (22%)	
African American	1 (25%)	2 (50%)	1 (25%)	
Other	4 (44%)	1 (11%)	4 (44%)	
<u>Ethnicity</u>				<.001
Hispanic	4 (40%)	2 (20%)	4 (40%)	
Not Hispanic	29 (60%)	8 (17%)	11 (23%)	

*p <.001 due to large sample size and multiple testing

Note. Some participants may report multiple reasons for use of one modality. *P*-value examined the statistical difference between the frequency of the top three most used CAM in each category and frequency of reasons for reported use of CAM for each category.

RQ 6. Which predisposing factors (e.g., age, marital status, education, race/ethnicity, and sex) influence use of CAM modalities?

Log-linear analysis was used to examine two-way (partial) and three-way relationships/associations among three categorical variables. The following Tables present significant two-way associations for the predisposing variables of interest. Figure 4.1 displays a significant three-way interaction for the predisposing variables of interest. Log-linear analysis found no significant association between ethnicity and CAM modalities.

Statistically significant data only display a magnitude of the difference (Field, 2013). P-values are directly linked to the sample size. Therefore, small effects can be deemed significant in large samples such as the NHIS (Field, 2013). Although the following interactions were statistically significant, the interaction does not indicate how useful or meaningful the variables were. Therefore, Cramér's V was used to test the association between the two categorical variables. Following Cohen (1988) recommendations, an effect size value for chi-square analysis with a $df=1$ is .10 (small), .30 (medium), and .50 (large). Therefore, a statistically significant measure with a small effect size or higher indicates a meaningful difference for the study (Cohen, 1988). The Cramér's statistic for Table 4.13 is .115 out of a possible maximum value of 1; which indicates a small association between age and the use of a practitioner for massage.

As shown in Table 4.13, 60% of participants aged 18 to 29 reported that they saw a practitioner for massage compared to 42% of participants aged 70 or older (i.e., reported use of a practitioner for massage decreased as participants aged).

Table 4.13

Significant Interaction Between Age and Massage Among a National Sample of Adults (N= 34,525)

		Saw a practitioner for massage, past 12 months			
			Yes	No	Total
Age	18-29	Count	347	242	589
		% within Age	58.9%	41.1%	100.0%
	30-39	Count	527	358	885
		% within Age	59.5%	40.5%	100.0%
	40-49	Count	443	386	829
		% within Age	53.4%	46.6%	100.0%
	50-59	Count	459	454	913
		% within Age	50.3%	49.7%	100.0%
	60-69	Count	329	375	704
		% within Age	46.7%	53.3%	100.0%
	70+	Count	171	238	409
		% within Age	41.8%	58.2%	100.0%
Total		Count	2276	2053	4329
		% within Age	52.6%	47.4%	100.0%

*p <.001 due to large sample size and multiple testing

Note. Some predictors do not add up to total sample due to missing values.

Eighty percent of participants aged 70 or older used multi-vitamin or mineral supplements compared to 75% of participants aged 18 to 29 and 40 to 49. As shown in Table 4.14, with the exception of participants aged 40-49, as participants aged, the use of multi-vitamin or multi-mineral supplements increased. The Cramér’s statistic is .044 out of a possible maximum value of 1; which indicates no meaningful association between age the use of multi-vitamin or mineral supplements.

Table 4.14

Significant Interaction Between Age and Multi-vitamin or Mineral Supplements Among a National Sample of Adults (N= 34,525)

		Taken multi-vitamin or multi-minerals in past 12 months		
		Yes	No	Total
Age 18-29	Count	2933	983	3916
	% within Age	74.9%	25.1%	100.0%
30-39	Count	3016	894	3910
	% within Age	77.1%	22.9%	100.0%
40-49	Count	2774	932	3706
	% within Age	74.9%	25.1%	100.0%
50-59	Count	3239	937	4176
	% within Age	77.6%	22.4%	100.0%
60-69	Count	2848	754	3602
	% within Age	79.1%	20.9%	100.0%
70+	Count	2683	682	3365
	% within Age	79.7%	20.3%	100.0%
Total	Count	17493	5182	22675
	% within Age	77.1%	22.9%	100.0%

*p <.001 due to large sample size and multiple testing

Note. Some predictors do not add up to total sample due to missing values.

Six percent of participants aged 50 to 59 used one or more relaxation techniques compared to 2% of participants aged 70 or older. As shown in Table 4.15, the use of one or more relaxation techniques increased until participants reached the age of 60 to 69. The Cramér’s statistic is .065 out of a possible maximum value of 1; which indicates no meaningful association between age and the use of one or more relaxation techniques.

Table 4.15

Significant Interaction Between Age and Relaxation Techniques Among a National Sample of Adults (N= 34,525)

		Relaxation Techniques			
		None	One or more	Total	
Age	18-29	Count	6140	280	6420
		% within Age	95.6%	4.4%	100.0%
	30-39	Count	5716	298	6014
		% within Age	95.0%	5.0%	100.0%
	40-49	Count	5435	296	5731
		% within Age	94.8%	5.2%	100.0%
	50-59	Count	5711	380	6091
		% within Age	93.8%	6.2%	100.0%
	60-69	Count	4917	276	5193
		% within Age	94.7%	5.3%	100.0%
	70+	Count	4991	85	5076
		% within Age	98.3%	1.7%	100.0%
Total		Count	32910	1615	34525
		% within Age	95.3%	4.7%	100.0%

*p <.001 due to large sample size and multiple testing

According to Table 4.16, 14% of participants aged 18 to 29 practiced yoga, tai chi, or qi gong compared to 3% of participants aged 70 or older (i.e., the use of yoga, tai chi, or qi gong decreased as participants aged). The Cramér’s statistic is .123 out of a possible maximum value of 1; which indicates a small meaningful association between age and the use of yoga, tai chi, or qi gong.

Table 4.16

Significant Interaction Between Age and Yoga, Tai Chi, and Qi gong Among a National Sample of Adults (N= 34,525)

		Yoga, Tai Chi, and Qi gong			
		None	One or More	Total	
Age	18-29	Count	5555	865	6420
		% within Age	86.5%	13.5%	100.0%
	30-39	Count	5215	799	6014
		% within Age	86.7%	13.3%	100.0%
	40-49	Count	5218	513	5731
		% within Age	91.0%	9.0%	100.0%
	50-59	Count	5587	504	6091
		% within Age	91.7%	8.3%	100.0%
	60-69	Count	4821	372	5193
		% within Age	92.8%	7.2%	100.0%
	70+	Count	4924	152	5076
		% within Age	97.0%	3.0%	100.0%
Total		Count	31320	3205	34525
		% within Age	90.7%	9.3%	100.0%

*p <.001 due to large sample size and multiple testing

According to Table 4.17, 1% of participants aged 18 to 59 used one or more movement therapies (i.e., the use of one or more movement therapies decreased with age). The Cramér’s statistic is .031 out of a possible maximum value of 1; which indicates no meaningful association between age and the use of one or more movement therapies.

Table 4.17

Significant Interaction Between Age and Movement Therapies Among a National Sample of Adults (N= 34,525)

		Movement Therapies			
		None	One or more	Total	
Age	18-29	Count	6376	44	6420
		% within Age	99.3%	0.7%	100.0%
	30-39	Count	5971	43	6014
		% within Age	99.3%	0.7%	100.0%
	40-49	Count	5702	29	5731
		% within Age	99.5%	0.5%	100.0%
	50-59	Count	6053	38	6091
		% within Age	99.4%	0.6%	100.0%
	60-69	Count	5173	20	5193
		% within Age	99.6%	0.4%	100.0%
	70+	Count	5073	3	5076
		% within Age	99.9%	0.1%	100.0%
Total		Count	34348	177	34525
		% within Age	99.5%	0.5%	100.0%

*p <.001 due to large sample size and multiple testing

Forty-three percent of participants aged 18 to 29 saw a practitioner for chiropractic or osteopathic manipulation compared to 29% of participants aged 70 or older. As shown in Table 4.18, reported use of a practitioner for chiropractic or osteopathic manipulation decreased with age. The Cramér’s statistic is .103 out of a possible maximum value of 1; which indicates a small meaningful association between age and the use of a practitioner for chiropractic or osteopathic manipulation.

Table 4.18

Significant Interaction Between Age and Chiropractic or Osteopathic Manipulation Among a National Sample of Adults (N= 34,525)

		Saw a practitioner for chiropractic or osteopathic manipulation, past 12 months			
		Yes	No	Total	
Age	18-29	Count	387	517	904
		% within Age	42.8%	57.2%	100.0%
	30-39	Count	503	730	1233
		% within Age	40.8%	59.2%	100.0%
	40-49	Count	547	870	1417
		% within Age	38.6%	61.4%	100.0%
	50-59	Count	537	1142	1679
		% within Age	32.0%	68.0%	100.0%
	60-69	Count	477	1040	1517
		% within Age	31.4%	68.6%	100.0%
	70+	Count	334	818	1152
		% within Age	29.0%	71.0%	100.0%
Total		Count	2785	5117	7902
		% within Age	35.2%	64.8%	100.0%

*p <.001 due to large sample size and multiple testing

Note. Some predictors do not add up to total sample due to missing values.

Thirty-seven percent of participants aged 30 to 39 saw a practitioner for acupuncture compared to 22% of participants aged 60 to 69. As shown in Table 4.19, reported use of a practitioner for acupuncture decreased as participants aged. The Cramér’s statistic is .118 out of a possible maximum value of 1; which indicates a small meaningful association between age and the use of a practitioner for acupuncture.

Table 4.19

Significant Interaction Between Age and Acupuncture Among a National Sample of Adults (N= 34,525)

		Saw a practitioner for acupuncture, past 12 months			
		Yes	No	Total	
Age	18-29	Count	45	93	138
		% within Age	32.6%	67.4%	100.0%
	30-39	Count	124	210	334
		% within Age	37.1%	62.9%	100.0%
	40-49	Count	99	257	356
		% within Age	27.8%	72.2%	100.0%
	50-59	Count	121	387	508
		% within Age	23.8%	76.2%	100.0%
	60-69	Count	98	349	447
		% within Age	21.9%	78.1%	100.0%
	70+	Count	85	267	352
		% within Age	24.1%	75.9%	100.0%
Total		Count	572	1563	2135
		% within Age	26.8%	73.2%	100.0%

*p <.001 due to large sample size and multiple testing

Note. Some predictors do not add up to total sample due to missing values.

Seventy-eight percent of participants who were married used multi-vitamin or mineral supplements compared to 74% of participants who were separated. As shown in Table 4.20, participants who were separated or never married used multi-vitamin or mineral supplements less than those who were married, divorced, widowed, or cohabitating. The Cramér’s statistic is .032 out of a possible maximum value of 1; which indicates no meaningful association between marital status and the use of multi-vitamin or mineral supplements.

Table 4.20

Significant Interaction Between Marital Status and Multi-vitamins or Mineral Supplements Among a National Sample of Adults (N= 34,525)

		Taken multi-vitamins or multi-minerals in past 12 months			
		Yes	No	Total	
Marital Status	Married	Count	7931	2227	10158
		% within Marital Status	78.1%	21.9%	100.0%
Divorced/ Widowed		Count	4247	1208	5455
		% within Marital Status	77.9%	22.1%	100.0%
Separated		Count	447	155	602
		% within Marital Status	74.3%	25.7%	100.0%
Never Married		Count	3790	1259	5049
		% within Marital Status	75.1%	24.9%	100.0%
Cohabitating		Count	1039	324	1363
		% within Marital Status	76.2%	23.8%	100.0%
Total		Count	17454	5173	22627
		% within Marital Status	77.1%	22.9%	100.0%

*p <.001 due to large sample size and multiple testing

Note. Some predictors do not add up to total sample due to missing values.

Twelve percent of participants who were never married practiced yoga, tai chi, or qi gong compared to 7% of participants who were separated. As shown in Table 4.21, participants who were divorced, widowed, or separated practiced yoga, tai chi, or qi gong less than those who were married, never married, or cohabitating. The Cramér’s statistic is .067 out of a possible maximum value of 1; which indicates no meaningful association between marital status and the use of yoga, tai chi, and qi gong.

Table 4.21

Significant Interaction Between Marital Status and Yoga, Tai Chi, or Qi gong Among a National Sample of Adults (N= 34,525)

		Yoga, Tai Chi, and Qi gong			
		None	One or More	Total	
Marital Status	Married	Count	13636	1294	14930
		% within Marital Status	91.3%	8.7%	100.0%
Divorced/ Widowed		Count	7501	582	8083
		% within Marital Status	92.8%	7.2%	100.0%
Separated		Count	968	73	1041
		% within Marital Status	93.0%	7.0%	100.0%
Never Married		Count	7246	1024	8270
		% within Marital Status	87.6%	12.4%	100.0%
Cohabiting		Count	1896	227	2123
		% within Marital Status	89.3%	10.7%	100.0%
Total		Count	31247	3200	34447
		% within Marital Status	90.7%	9.3%	100.0%

*p <.001 due to large sample size and multiple testing

Note. Some predictors do not add up to total sample due to missing values.

Thirty-nine percent of participants who were never married saw a practitioner for chiropractic or osteopathic manipulation compared to 30% of participants who were separated. As shown in Table 4.22, participants who were divorced, widowed, cohabitating, or separated used a practitioner for chiropractic or osteopathic manipulation less than those who were married or never married. The Cramér’s statistic is .050 out of a possible maximum value of 1; which indicates no meaningful association between marital status and the use of a practitioner for chiropractic or osteopathic manipulation.

Table 4.22

Significant Interaction Between Marital Status and Chiropractic or Osteopathic Manipulation Among a National Sample of Adults (N= 34,525)

		Saw a practitioner for chiropractic or osteopathic manipulation, past 12 months		Total	
		Yes	No		
Marital Status	Married	Count	1405	2500	3905
		% within Marital Status	36.0%	64.0%	100.0%
	Divorced/ Widowed	Count	668	1398	2066
		% within Marital Status	32.3%	67.7%	100.0%
	Separated	Count	57	131	188
		% within Marital Status	30.3%	69.7%	100.0%
	Never Married	Count	509	794	1303
		% within Marital Status	39.1%	60.9%	100.0%
	Cohabitating	Count	140	283	423
		% within Marital Status	33.1%	66.9%	100.0%
Total		Count	2779	5106	7885
		% within Marital Status	35.2%	64.8%	100.0%

*p <.001 due to large sample size and multiple testing

Note. Some predictors do not add up to total sample due to missing values.

One percent of participants who were never married or cohabitating reported using one or more movement therapies. As shown in Table 4.23, participants who were divorced, widowed, and separated used one or more movement therapies less than participants who were married, never married, or cohabitating. The Cramér’s statistic is .020 out of a possible maximum value of 1; which indicates no meaningful association between marital status and the use of one or more movement therapies.

Table 4.23

Significant Interaction Between Marital Status and Movement Therapies Among a National Sample of Adults (N= 34,525)

		Movement Therapies			
		None	One or more	Total	
Marital Status	Married	Count	14847	83	14930
		% within Marital Status	99.4%	0.6%	100.0%
	Divorced/ Widowed	Count	8058	25	8083
		% within Marital Status	99.7%	0.3%	100.0%
	Separated	Count	1039	2	1041
		% within Marital Status	99.8%	0.2%	100.0%
	Never Married	Count	8213	57	8270
		% within Marital Status	99.3%	0.7%	100.0%
	Cohabiting	Count	2113	10	2123
		% within Marital Status	99.5%	0.5%	100.0%
Total		Count	34270	177	34447
		% within Marital Status	99.5%	0.5%	100.0%

*p <.001 due to large sample size and multiple testing

Note. Some predictors do not add up to total sample due to missing values.

Seventy-eight percent of participants who reported a family member had more than a high school education used multi-vitamin or mineral supplements. As shown in Table 4.24, the use of multi-vitamin or mineral supplements increased as educational attainment increased. The Cramér’s statistic is .045 out of a possible maximum value of 1; which indicates no meaningful association between education and the use multi-vitamin or mineral supplements.

Table 4.24

Significant Interaction Between Education and Multi-vitamin or Minerals Among a National Sample of Adults (N= 34,525)

		Taken multi-vitamins or multi-minerals in past 12 months			
			Yes	No	Total
Education	Less Than	Count	430	144	574
	High School	% within Education	74.9%	25.1%	100.0%
	High School	Count	4082	1439	5521
		% within Education	73.9%	26.1%	100.0%
More than	Count	12957	3594	16551	
	High School	% within Education	78.3%	21.7%	100.0%
Total	Count	17469	5177	22646	
	% within Education	77.1%	22.9%	100.0%	

*p <.001 due to large sample size and multiple testing

Note. Some predictors do not add up to total sample due to missing values.

According to Table 4.25, 54% of participants who reported a family member had more than a high school education saw a practitioner for massage (i.e., the use of a practitioner for massage increased as educational attainment increased). The Cramér’s statistic is .082 out of a possible maximum value of 1; which indicates no meaningful association between education and the use of a practitioner for massage.

Table 4.25

Significant Interaction Between Education and Massage Among a National Sample of Adults (N= 34,525)

		Saw a practitioner for massage, past 12 months			
		Yes	No	Total	
Education	Less than	Count	24	31	55
	High School	% within Education	43.6%	56.4%	100.0%
	High School	Count	273	360	633
		% within Education	43.1%	56.9%	100.0%
	More than	Count	1978	1660	3638
	High School	% within Education	54.4%	45.6%	100.0%
Total		Count	2275	2051	4326
		% within Education	52.6%	47.4%	100.0%

*p <.001 due to large sample size and multiple testing

Note. Some predictors do not add up to total sample due to missing values.

Thirteen percent of participants who reported a family member had more than a high school education practiced yoga, tai chi, or qi gong. As shown in Table 4.26, practicing yoga, tai chi, and qi gong increased as educational attainment increased. The Cramér’s statistic is .159 out of a possible maximum value of 1; which indicates a small meaningful association between education and the use yoga, tai chi, and qi gong.

Table 4.26

Significant Interaction Between Education and Yoga, Tai Chi, and Qi gong Among a National Sample of Adults (N= 34,525)

		Yoga, Tai Chi, and Qi gong			
			None	One or More	Total
Education	Less than High School	Count	1265	15	1280
		% within Education	98.8%	1.2%	100.0%
	High School	Count	9753	294	10047
		% within Education	97.1%	2.9%	100.0%
	More than High School	Count	20234	2896	23130
		% within Education	87.5%	12.5%	100.0%
Total	Count		31252	3205	34457
	% within Education		90.7%	9.3%	100.0%

*p <.001 due to large sample size and multiple testing

Note. Some predictors do not add up to total sample due to missing values.

Six percent of participants who reported a family member had more than a high school education practiced one or more relaxation techniques. As shown in Table 4.27, the use of one or more relaxation techniques increased as educational attainment increased. The Cramér’s statistic is .105 out of a possible maximum value of 1; which indicates a small meaningful association between education and the use of one or more relaxation techniques.

Table 4.27

Significant Interaction Between Education and Relaxation Techniques Among a National Sample of Adults (N= 34,525)

		Relaxation Techniques			
		None	One or more	Total	
Education	Less than	Count	1271	9	1280
	High School	% within Education	99.3%	0.7%	100.0%
	High School	Count	9882	165	10047
		% within Education	98.4%	1.6%	100.0%
	More than	Count	21689	1441	23130
	High School	% within Education	93.8%	6.2%	100.0%
Total		Count	32842	1615	34457
		% within Education	95.3%	4.7%	100.0%

*p <.001 due to large sample size and multiple testing

Note. Some predictors do not add up to total sample due to missing values.

According to Table 4.28, 1% of participants who reported a family member had more than a high school education used one or more movement therapies (i.e., the use of one or more movement therapies increased as educational attainment increased). The Cramér’s statistic is .043 out of a possible maximum value of 1; which indicates no meaningful association between education and the use of one or more movement therapies.

Table 4.28

Significant Interaction Between Education and Movement Therapies Among a National Sample of Adults (N= 34,525)

		Movement Therapies			
		None	One or more	Total	
Education	Less than High School	Count	1280	0	1280
		% within Education	100.0%	0.0%	100.0%
High School		Count	10038	9	10047
		% within Education	99.9%	0.1%	100.0%
More than High School		Count	22962	168	23130
		% within Education	99.3%	0.7%	100.0%
Total		Count	34280	177	34457
		% within Education	99.5%	0.5%	100.0%

*p <.001 due to large sample size and multiple testing

According to Table 4.29, 5% of White participants practiced one or more relaxation techniques compared to 3% of AA participants. The Cramér’s statistic is .038 out of a possible maximum value of 1; which indicates no meaningful association between race and the use of one or more relaxation techniques.

Table 4.29

Significant Interaction Between Race and Relaxation Techniques Among a National Sample of Adults (N= 34,525)

		Relaxation Techniques			
		None	One or more	Total	
Race	White	Count	24633	1306	25939
		% within Race	95.0%	5.0%	100.0%
	African American	Count	5171	148	5319
		% within Race	97.2%	2.8%	100.0%
	Other	Count	3106	161	3267
		% within Race	95.1%	4.9%	100.0%
Total		Count	32910	1615	34525
		% within Race	95.3%	4.7%	100.0%

*p <.001 due to large sample size and multiple testing

Table 4.30 indicates that 10% of White participants practiced yoga, tai chi, or qi gong compared to 5% of AA participants. The Cramér’s statistic is .068 out of a possible maximum value of 1; which indicates no meaningful association between race and the use of yoga, tai chi, and qi gong.

Table 4.30

Significant Interaction Between Race and Yoga, Tai Chi, and Qi gong Among a National Sample of Adults (N= 34,525)

		Yoga, Tai Chi, and Qi gong			
			None	One or More	Total
Race	White	Count	23459	2480	25939
		% within Race	90.4%	9.6%	100.0%
	African American	Count	5030	289	5319
		% within Race	94.6%	5.4%	100.0%
	Other	Count	2831	436	3267
		% within Race	86.7%	13.3%	100.0%
Total		Count	31320	3205	34525
		% within Race	90.7%	9.3%	100.0%

*p <.001 due to large sample size and multiple testing

One percent of White participants used one or more movement therapies (see Table 4.31). Less than one percent of AA participants used one or more movement therapies. The Cramér’s statistic is .017 out of a possible maximum value of 1; which indicates no meaningful association between race and the use of one or more movement therapies.

Table 4.31

Significant Interaction Between Race and Movement Therapies Among a National Sample of Adults (N= 34,525)

		Movement Therapies		Total	
		None	One or more		
Race	White	Count	25788	151	25939
		% within Race	99.4%	0.6%	100.0%
	African American	Count	5305	14	5319
		% within Race	99.7%	0.3%	100.0%
	Other	Count	3255	12	3267
		% within Race	99.6%	0.4%	100.0%
Total		Count	34348	177	34525
		% within Race	99.5%	0.5%	100.0%

*p <.001 due to large sample size and multiple testing

According to Table 4.32, 36% of White participants saw a practitioner for chiropractic or osteopathic manipulation compared to 27% of AA participants. The Cramér’s statistic is .056 out of a possible maximum value of 1; which indicates no meaningful association between race and the use of a practitioner for chiropractic or osteopathic manipulation.

Table 4.32

Significant Interaction Between Race and Chiropractic or Osteopathic Manipulation Among a National Sample of Adults (N= 34,525)

		Saw a practitioner for chiropractic or osteopathic manipulation, past 12 months			
		Yes	No	Total	
Race	White	Count	2456	4318	6774
		% within Race	36.3%	63.7%	100.0%
	African American	Count	155	430	585
		% within Race	26.5%	73.5%	100.0%
	Other	Count	174	369	543
		% within Race	32.0%	68.0%	100.0%
Total		Count	2785	5117	7902
		% within Race	35.2%	64.8%	100.0%

*p <.001 due to large sample size and multiple testing

Note. Some predictors do not add up to total sample due to missing values.

Three percent (3%) of White participants used one or more special diets compared to 2% of AA participants (see Table 4.33). The Cramér’s statistic is .025 out of a possible maximum value of 1; which indicates no meaningful association between race and the use of one or more special diets.

Table 4.33

Significant Interaction Between Race and Special Diets Among a National Sample of Adults (N= 34,525)

		Special Diets			
		None	One or more	Total	
Race	White	Count	25162	777	25939
		% within Race	97.0%	3.0%	100.0%
African American		Count	5200	119	5319
		% within Race	97.8%	2.2%	100.0%
Other		Count	3136	131	3267
		% within Race	96.0%	4.0%	100.0%
Total		Count	33498	1027	34525
		% within Race	97.0%	3.0%	100.0%

*p <.001 due to large sample size and multiple testing

According to Table 4.34, 55% of female participants saw a practitioner for massage compared to 48% of male participants. The Cramér's statistic is .075 out of a possible maximum value of 1; which indicates no meaningful association between sex and the use of a practitioner for massage.

Table 4.34

Significant Interaction Between Sex and Massage Among a National Sample of Adults (N= 34,525)

		Saw a practitioner for massage, past 12 months			
		Yes	No	Total	
Sex	Male	Count	755	829	1584
		% within Sex	47.7%	52.3%	100.0%
	Female	Count	1521	1224	2745
		% within Sex	55.4%	44.6%	100.0%
Total		Count	2276	2053	4329
		% within Sex	52.6%	47.4%	100.0%

*p <.001 due to large sample size and multiple testing

Note. Some predictors do not add up to total sample due to missing values.

Table 4.35 indicates that 79% of female participants used multi-vitamin or mineral supplements compared to 75% of male participants. The Cramér’s statistic is .045 out of a possible maximum value of 1; which indicates no meaningful association between sex and the use of multi-vitamin or mineral supplements.

Table 4.35

Significant Interaction Between Sex and Multi-vitamin or Mineral Supplements Among a National Sample of Adults (N= 34,525)

		Taken multi-vitamins or multi-minerals in past 12 months			
		Yes	No	Total	
Sex	Male	Count	6976	2340	9316
		% within Sex	74.9%	25.1%	100.0%
	Female	Count	10517	2842	13359
		% within Sex	78.7%	21.3%	100.0%
Total		Count	17493	5182	22675
		% within Sex	77.1%	22.9%	100.0%

*p <.001 due to large sample size and multiple testing

Note. Some predictors do not add up to total sample due to missing values.

According to Table 4.36, 12% of female participants practiced yoga, tai chi, or qi gong compared to 6% of males. The Cramér’s statistic is .113 out of a possible maximum value of 1; which indicates a small meaningful association between sex and the use of yoga, tai chi, and qi gong.

Table 4.36

Significant Interaction Between Sex and Yoga, Tai Chi, and Qi Gong Among a National Sample of Adults (N= 34,525)

		Yoga, Tai Chi, and Qi gong			
		None	One or More	Total	
Sex	Male	Count	14418	855	15273
		% within Sex	94.4%	5.6%	100.0%
	Female	Count	16902	2350	19252
		% within Sex	87.8%	12.2%	100.0%
Total		Count	31320	3205	34525
		% within Sex	90.7%	9.3%	100.0%

*p <.001 due to large sample size and multiple testing

Six percent (6%) of female participants practiced one or more relaxation techniques compared to 4% of male participants (see Table 4.37). The Cramér’s statistic is .047 out of a possible maximum value of 1; which indicates no meaningful association between sex and the use of one or more relaxation techniques.

Table 4.37

Significant Interaction Between Sex and Relaxation Techniques Among a National Sample of Adults (N= 34,525)

		Relaxation Techniques			
		None	One or more	Total	
Sex	Male	Count	14730	543	15273
		% within Sex	96.4%	3.6%	100.0%
	Female	Count	18180	1072	19252
		% within Sex	94.4%	5.6%	100.0%
Total		Count	32910	1615	34525
		% within Sex	95.3%	4.7%	100.0%

*p <.001 due to large sample size and multiple testing

According to Table 4.38, 37% of female participants saw a practitioner for chiropractic or osteopathic manipulation compared to 33% of male participants. The Cramér’s statistic is .049 out of a possible maximum value of 1; which indicates no meaningful association between sex and the use of a practitioner for chiropractic or osteopathic manipulation.

Table 4.38

Significant Interaction Between Sex and Chiropractic or Osteopathic Manipulation Among a National Sample of Adults (N= 34,525)

Saw a practitioner for chiropractic or osteopathic manipulation, past 12 months

			Yes	No	
Sex	Male	Count	1114	2306	3420
		% within Sex	32.6%	67.4%	100.0%
	Female	Count	1671	2811	4482
		% within Sex	37.3%	62.7%	100.0%
Total		Count	2785	5117	7902
		% within Sex	35.2%	64.8%	100.0%

*p <.001 due to large sample size and multiple testing

Note. Some predictors do not add up to total sample due to missing values.

Table 4.39 indicates that 1% of female participants used one or more movement therapies. The Cramér’s statistic is .040 out of a possible maximum value of 1; which indicates no meaningful association between sex and the use of one or more movement therapies.

Table 4.39

Significant Interaction Between Sex and Movement Therapies Among a National Sample of Adults (N= 34,525)

		Movement Therapies		Total	
		None	One or more		
Sex	Male	Count	15244	29	15273
		% within Sex	99.8%	0.2%	100.0%
	Female	Count	19104	148	19252
		% within Sex	99.2%	0.8%	100.0%
Total		Count	34348	177	34525
		% within Sex	99.5%	0.5%	100.0%

*p <.001 due to large sample size and multiple testing

According to Table 4.40, 61% of male participants reported seeing a practitioner for homeopathy compared to 54% of female participants. The Cramér’s statistic is .061 out of a possible maximum value of 1; which indicates no meaningful association between sex and the use of a practitioner for homeopathy.

Table 4.40

Significant Interaction Between Sex and Homeopathy Among a National Sample of Adults (N= 34,525)

		Saw a practitioner for homeopathy, past 12 months			
		Yes	No	Total	
Sex	Male	Count	41	26	67
		% within Sex	61.2%	38.8%	100.0%
	Female	Count	99	83	182
		% within Sex	54.4%	45.6%	100.0%
Total		Count	140	109	249
		% within Sex	56.2%	43.8%	100.0%

*p <.001 due to large sample size and multiple testing

Note. Some predictors do not add up to total sample due to missing values.

Three percent (3%) of female participants reported using one or more special diets compared to 2% of male participants (see Table 4.41). The Cramér’s statistic is .028 out of a possible maximum value of 1; which indicates no meaningful association between sex and the use of one or more special diets.

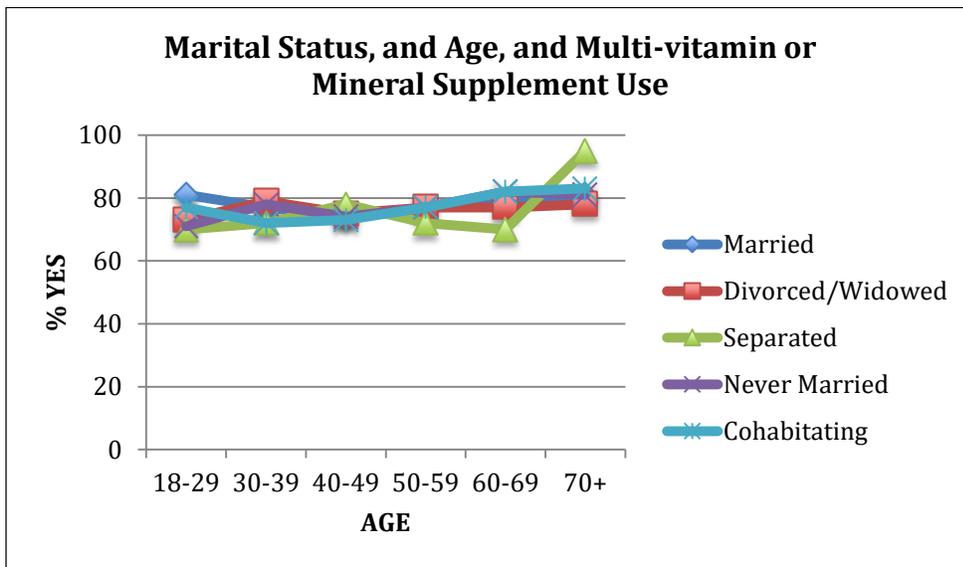
Table 4.41

Significant Interaction Between Sex and Special Diets Among a National Sample of Adults (N= 34,525)

		Special Diets			
		None	One or more	Total	
Sex	Male	Count	14899	374	15273
		% within Sex	97.6%	2.4%	100.0%
	Female	Count	18599	653	19252
		% within Sex	96.6%	3.4%	100.0%
Total		Count	33498	1027	34525
		% within Sex	97.0%	3.0%	100.0%

*p <.001 due to large sample size and multiple testing

Figure 4.1 displays significant interaction between marital status, age, and multi-vitamin or mineral supplement use. Ninety-five percent (95%) of participants who were 70 years of age or older and separated used multi-vitamin or mineral supplements compared to 81% of participants who were divorced or widowed in the same age group. Seventy one percent (71%) of participants who were 18 to 29 years old and never married used multi-vitamin or mineral supplements compared to 77% of 18 to 29 year-olds who were cohabitating. The Cramér's statistic is .283 out of a possible maximum value of 1; which indicates a small to medium association between marital status, age, and the use of multi-vitamin or mineral supplements.



*p < .001 due to large sample size and multiple testing

Figure 4.1 Significant interactions between marital status, age, multi-vitamin or mineral supplement use among a national sample of adults (N= 34,525)

RQ 7. Which enabling resources (e.g., household income, current health insurance status, delay in medical care, and US Census Bureau geographic region) influence use of CAM modalities?

Log-linear analysis was used to examine the relationship/association for enabling variables of interest. The following Tables display significant two-way associations for the enabling variables of interest. Due to the small p value, there were no significant three-way associations between enabling variables of interest and CAM modalities.

As shown in Table 4.42, 62% of participants who reported a yearly income of $\geq \$100,000$ saw a practitioner for massage compared to 45% of participants who reported a yearly income of $\leq \$34,999$. As income increased, so did the use of a practitioner for massage.

The Cramér's statistic is .133 out of a possible maximum value of 1; which indicates a small meaningful association between family income and the use of a practitioner for massage.

Table 4.42

Significant Interaction Between Income and Massage Among a National Sample of Adults (N=34,525)

			Saw a practitioner for massage, past 12 months		
			Yes	No	Total
Total combined family income (grouped)	\$0-\$34,999	Count	568	699	1267
		% within Total combined family income (grouped)	44.8%	55.2%	100.0%
	\$35,000 - \$74,999	Count	671	646	1317
		% within Total combined family income (grouped)	50.9%	49.1%	100.0%
	\$75,000 - \$99,999	Count	322	234	556
		% within Total combined family income (grouped)	57.9%	42.1%	100.0%
	\$100,000 and over	Count	620	381	1001
		% within Total combined family income (grouped)	61.9%	38.1%	100.0%
Total		Count	2181	1960	4141
		% within Total combined family income (grouped)	52.7%	47.3%	100.0%

*p <.001 due to large sample size and multiple testing

Note. Some predictors do not add up to total sample due to missing values.

Seventy-nine percent of participants who reported a yearly income of \geq \$100,000 used multi-vitamin or mineral supplements compared to 75% of participants who reported a yearly income of \leq \$34,999. Table 4.43 indicates that as income increased, so did the use of multi-vitamin or mineral supplements. The Cramér’s statistic is .038 out of a possible maximum value of 1; which indicates no meaningful association between income and the use of multi-vitamin or mineral supplements.

Table 4.43

Significant Interaction Between Income and Multi-vitamin or Mineral Supplements Among a National Sample of Adults (N= 34,525)

			Taken multi-vitamins or multi-minerals in past 12 months		
			Yes	No	Total
Total	\$0-	Count	6297	2095	8392
	\$34,999	% within Total combined family income (grouped)	75.0%	25.0%	100.0%
income (grouped)	\$35,000 -	Count	5294	1491	6785
	\$74,999	% within Total combined family income (grouped)	78.0%	22.0%	100.0%
	\$75,000 -	Count	1844	520	2364
	\$99,999	% within Total combined family income (grouped)	78.0%	22.0%	100.0%
	\$100,000	Count	3092	835	3927
	and over	% within Total combined family income (grouped)	78.7%	21.3%	100.0%
Total		Count	16527	4941	21468
		% within Total combined family income (grouped)	77.0%	23.0%	100.0%

*p <.001 due to large sample size and multiple testing

Note. Some predictors do not add up to total sample due to missing values.

Two percent of participants who reported a yearly income of \leq \$34,999 and \$35,000-\$74,999 used one or more traditional healers. As shown in Table 4.44, as income increased, the use of one or more traditional healers decreased. The Cramér’s statistic is .031 out of a possible maximum value of 1; which indicates no meaningful association between income and the use of one or more traditional healers.

Table 4.44

Significant Interaction Between Income and Traditional Healers Among a National Sample of Adults (N= 34,525)

		Traditional Healers			
		None	One or more	Total	
Total combined family income (grouped)	\$0-\$34,999	Count	14064	285	14349
		% within Total combined family income (grouped)	98.0%	2.0%	100.0%
	\$35,000 - \$74,999	Count	9750	168	9918
		% within Total combined family income (grouped)	98.3%	1.7%	100.0%
	\$75,000 - \$99,999	Count	3216	33	3249
		% within Total combined family income (grouped)	99.0%	1.0%	100.0%
	\$100,000 and over	Count	5029	50	5079
		% within Total combined family income (grouped)	99.0%	1.0%	100.0%
	Total	Count	32059	536	32595
		% within Total combined family income (grouped)	98.4%	1.6%	100.0%

*p <.001 due to large sample size and multiple testing

Note. Some predictors do not add up to total sample due to missing values.

Table 4.45 displays information regarding income and use of special diets. Four percent (4%) of participants who reported a yearly income of \geq \$100,000 used one or more special diets (i.e., as income increased, so did the use of special diets). The Cramér’s statistic is .030 out of a possible maximum value of 1; which indicates no meaningful association between income and the use of one or more special diets.

Table 4.45

Significant Interaction Between Income and Special Diets Among a National Sample of Adults (N= 34,525)

		Special Diets		Total	
		None	One or more		
Total combined family income (grouped)	\$0-\$34,999	Count	13993	359	14352
		% within Total combined family income (grouped)	97.5%	2.5%	100.0%
	\$35,000 - \$74,999	Count	9592	326	9918
		% within Total combined family income (grouped)	96.7%	3.3%	100.0%
	\$75,000 - \$99,999	Count	3142	108	3250
		% within Total combined family income (grouped)	96.7%	3.3%	100.0%
	\$100,000 and over	Count	4881	198	5079
		% within Total combined family income (grouped)	96.1%	3.9%	100.0%
Total		Count	31608	991	32599
		% within Total combined family income (grouped)	97.0%	3.0%	100.0%

*p <.001 due to large sample size and multiple testing

Note. Some predictors do not add up to total sample due to missing values.

One percent of participants who reported a yearly income of \$35,000-\$74,999, \$75,000-\$99,999 and \geq \$100,000 used one or more movement therapies. As shown in Table 4.46, as income increased, so did the use of one or more movement therapies. The Cramér’s statistic is .031 out of a possible maximum value of 1; which indicates no meaningful association between income and the use of one or more movement therapies.

Table 4.46

Significant Interaction Between Income and Movement Therapies Among a National Sample of Adults (N= 34,525)

		Movement Therapies		Total	
		None	One or more		
Total combined family income (grouped)	\$0-\$34,999	Count	14306	46	14352
		% within Total combined family income (grouped)	99.7%	0.3%	100.0%
	\$35,000 - \$74,999	Count	9867	51	9918
		% within Total combined family income (grouped)	99.5%	0.5%	100.0%
	\$75,000 - \$99,999	Count	3224	26	3250
		% within Total combined family income (grouped)	99.2%	0.8%	100.0%
	\$100,000 and over	Count	5033	46	5079
		% within Total combined family income (grouped)	99.1%	0.9%	100.0%
	Total	Count	32430	169	32599
		% within Total combined family income (grouped)	99.5%	0.5%	100.0%

*p <.001 due to large sample size and multiple testing

Note. Some predictors do not add up to total sample due to missing values.

Forty percent of participants who reported a yearly income of \$75,000-\$99,999 saw a practitioner for chiropractic or osteopathic manipulation. Table 4.47 indicates that as income increased, so did the use of a practitioner for chiropractic or osteopathic manipulation. The Cramér’s statistic is .077 out of a possible maximum value of 1; which indicates no meaningful association between income and the use of a practitioner for chiropractic or osteopathic manipulation.

Table 4.47

Significant Interaction Between Income and Chiropractic or Osteopathic Manipulation Among a National Sample of Adults (N= 34,525)

		Saw a practitioner for chiropractic or osteopathic manipulation, past 12 months			
		Yes	No	Total	
Total	\$0-	Count	767	1763	2530
combined	\$34,999	% within Total combined	30.3%	69.7%	100.0%
family		family income (grouped)			
income	\$35,000 -	Count	931	1611	2542
(grouped)	\$74,999	% within Total combined	36.6%	63.4%	100.0%
		family income (grouped)			
	\$75,000 -	Count	372	569	941
	\$99,999	% within Total combined	39.5%	60.5%	100.0%
		family income (grouped)			
	\$100,000	Count	574	907	1481
	and over	% within Total combined	38.8%	61.2%	100.0%
		family income (grouped)			
Total		Count	2644	4850	7494
		% within Total combined	35.3%	64.7%	100.0%
		family income (grouped)			

*p <.001 due to large sample size and multiple testing

Note. Some predictors do not add up to total sample due to missing values.

Six percent of participants who reported a yearly income of \$75,000-\$100,000 or more practiced one or more relaxation techniques compared to 4% of participants who reported a yearly income of ≤\$34,999. As shown in Table 4.48, as income increased, so did the use of one or more relaxation techniques. The Cramér’s statistic is .035 out of a possible maximum value of 1; which indicates no meaningful association between income and the use of one or more relaxation techniques.

Table 4.48

Significant Interaction Between Income and Relaxation Techniques Among a National Sample of Adults (N= 34,525)

		Relaxation Techniques			
		None	One or more	Total	
Total combined family income (grouped)	\$0-\$34,999	Count	13764	588	14352
		% within Total combined family income (grouped)	95.9%	4.1%	100.0%
	\$35,000 - \$74,999	Count	9427	491	9918
		% within Total combined family income (grouped)	95.0%	5.0%	100.0%
	\$75,000 - \$99,999	Count	3067	183	3250
		% within Total combined family income (grouped)	94.4%	5.6%	100.0%
	\$100,000 and over	Count	4768	311	5079
		% within Total combined family income (grouped)	93.9%	6.1%	100.0%
Total		Count	31026	1573	32599
		% within Total combined family income (grouped)	95.2%	4.8%	100.0%

*p <.001 due to large sample size and multiple testing

Note. Some predictors do not add up to total sample due to missing values.

According to Table 4.49, 1% of participants who reported a family member had health insurance used one or more traditional healers. The Cramér’s statistic is .048 out of a possible maximum value of 1; which indicates no meaningful association between health insurance status and the use of one or more traditional healers.

Table 4.49

Significant Interaction Between Insurance and Traditional Healers Among a National Sample of Adults (N= 34,525)

		Traditional Healers			
		None	One or more	Total	
Any family member have health insurance coverage?	Yes	Count	30792	439	31231
		% within Any family member have health insurance coverage?	98.6%	1.4%	100.0%
	No	Count	3123	113	3236
		% within Any family member have health insurance coverage?	96.5%	3.5%	100.0%
Total	Count	33915	552	34467	
	% within Any family member have health insurance coverage?	98.4%	1.6%	100.0%	

*p <.001 due to large sample size and multiple testing

Note. Some predictors do not add up to total sample due to missing values.

According to Table 4.50, 36% of participants who reported a family member had health insurance saw a practitioner for chiropractic or osteopathic manipulation. The Cramér’s statistic is .039 out of a possible maximum value of 1; which indicates no meaningful association between health insurance status and the use of a practitioner for chiropractic or osteopathic manipulation.

Table 4.50

Significant Interaction Between Insurance and Chiropractic or Osteopathic Manipulation Among a National Sample of Adults (N= 34,525)

		Saw a practitioner for chiropractic or osteopathic manipulation, past 12 months			
		Yes	No	Total	
Any family member have health insurance coverage?	Yes	Count	2612	4687	7299
		% within Any family member have health insurance coverage?	35.8%	64.2%	100.0%
	No	Count	171	424	595
		% within Any family member have health insurance coverage?	28.7%	71.3%	100.0%
Total		Count	2783	5111	7894
		% within Any family member have health insurance coverage?	35.3%	64.7%	100.0%

*p <.001 due to large sample size and multiple testing

Note. Some predictors do not add up to total sample due to missing values.

Table 4.51 indicates that 78% of participants who reported a family member had health insurance used multi-vitamin or mineral supplements. The Cramér’s statistic is .028 out of a possible maximum value of 1; which indicates no meaningful association between health insurance status and the use of multi-vitamin or mineral supplements.

Table 4.51

Significant Interaction Between Insurance and Multi-vitamin or Mineral Supplements Among a National Sample of Adults (N= 34,525)

		Taken multi-vitamins or multi-minerals in past 12 months			
		Yes	No	Total	
Any family member have health insurance coverage?	Yes	Count	16145	4693	20838
		% within Any family member have health insurance coverage?	77.5%	22.5%	100.0%
	No	Count	1321	484	1805
		% within Any family member have health insurance coverage?	73.2%	26.8%	100.0%
Total		Count	17466	5177	22643
		% within Any family member have health insurance coverage?	77.1%	22.9%	100.0%

*p <.001 due to large sample size and multiple testing

Note. Some predictors do not add up to total sample due to missing values.

According to Table 4.52, 11% of participants who practiced yoga, tai chi, or qi gong also reported a family member delayed medical care because of cost. The Cramér’s statistic is .033 out of a possible maximum value of 1; which indicates no meaningful association between delay in medical care and the use of yoga, tai chi, and qi gong.

Table 4.52

Significant Interaction Between Delay in Medical Care and Yoga, Tai Chi, and Qi gong Among a National Sample of Adults (N= 34,525)

		Yoga, Tai Chi, and Qi gong			
		None	One or More	Total	
Any family member delay seeking medical care, 12m?	Yes	Count	5200	668	5868
		% within Any family member delay seeking medical care, 12m?	88.6%	11.4%	100.0%
Total	No	Count	26113	2537	28650
		% within Any family member delay seeking medical care, 12m?	91.1%	8.9%	100.0%
		Count	31313	3205	34518
		% within Any family member delay seeking medical care, 12m?	90.7%	9.3%	100.0%

*p <.001 due to large sample size and multiple testing

Note. Some predictors do not add up to total sample due to missing values.

According to Table 4.53, 3% of participants who used one or more traditional healers also reported a family member delayed medical care because of cost. The Cramér’s statistic is .060 out of a possible maximum value of 1; which indicates no meaningful association between delay in medical care and the use of one or more traditional healers.

Table 4.53

Significant Interaction Between Delay in Medical Care and Traditional Healers Among a National Sample of Adults (N= 34,525)

		Traditional Healers			
		None	One or more	Total	
Any family member delay seeking medical care, 12m?	Yes	Count	5676	191	5867
		% within Any family member delay seeking medical care, 12m?	96.7%	3.3%	100.0%
12m?	No	Count	28285	362	28647
		% within Any family member delay seeking medical care, 12m?	98.7%	1.3%	100.0%
Total		Count	33961	553	34514
		% within Any family member delay seeking medical care, 12m?	98.4%	1.6%	100.0%

*p <.001 due to large sample size and multiple testing

Note. Some predictors do not add up to total sample due to missing values.

Table 4.54 indicates that 8% of participants who practiced one or more relaxation techniques also reported a family member delayed medical care because of cost. The Cramér’s statistic is .071 out of a possible maximum value of 1; which indicates no meaningful association between delay in medical care and the use of one or more relaxation techniques.

Table 4.54

Significant Interaction Between Delay in Medical Care and Relaxation Techniques Among a National Sample of Adults (N= 34,525)

			Relaxation Techniques		Total
			None	One or more	
Any family member delay seeking medical care, 12m?	Yes	Count	5399	469	5868
		% within Any family member delay seeking medical care, 12m?	92.0%	8.0%	100.0%
12m?	No	Count	27506	1144	28650
		% within Any family member delay seeking medical care, 12m?	96.0%	4.0%	100.0%
Total		Count	32905	1613	34518
		% within Any family member delay seeking medical care, 12m?	95.3%	4.7%	100.0%

*p <.001 due to large sample size and multiple testing

Note. Some predictors do not add up to total sample due to missing values.

According to Table 4.55, 75% of participants who used multi-vitamin or minerals also reported a family member delayed medical care because of cost. The Cramér’s statistic is .018 out of a possible maximum value of 1; which indicates no meaningful association between delay in medical care and the use of multi-vitamin or mineral supplements.

Table 4.55

Significant Interaction Between Delay in Medical Care and Multi-vitamin or Mineral Supplements Among a National Sample of Adults (N= 34,525)

		Taken multi-vitamins or multi-minerals in past 12 months			
		Yes	No	Total	
Any family member delay seeking medical care, 12m?	Yes	Count	2894	942	3836
		% within Any family member delay seeking medical care, 12m?	75.4%	24.6%	100.0%
	No	Count	14594	4240	18834
		% within Any family member delay seeking medical care, 12m?	77.5%	22.5%	100.0%
Total		Count	17488	5182	22670
		% within Any family member delay seeking medical care, 12m?	77.1%	22.9%	100.0%

*p <.001 due to large sample size and multiple testing
Note. Some predictors do not add up to total sample due to missing values.

Five (5%) of participants who used one or more special diets also reported a family member delayed medical care because of cost (see Table 4.56). The Cramér's statistic is .041 out of a possible maximum value of 1; which indicates no meaningful association between delay in medical care and the use of one or more special diets.

Table 4.56

Significant Interaction Between Delay in Medical Care and Special Diets Among a National Sample of Adults (N= 34,525)

		Special Diets		Total	
		None	One or more		
Any family member delay seeking medical care, 12m?	Yes	Count	5602	266	5868
		% within Any family member delay seeking medical care, 12m?	95.5%	4.5%	100.0%
	No	Count	27889	761	28650
		% within Any family member delay seeking medical care, 12m?	97.3%	2.7%	100.0%
Total		Count	33491	1027	34518
		% within Any family member delay seeking medical care, 12m?	97.0%	3.0%	100.0%

*p <.001 due to large sample size and multiple testing

Note. Some predictors do not add up to total sample due to missing values.

Forty-one percent of participants who lived in the Midwest saw a practitioner for chiropractic or osteopathic manipulation compared to 32% of participants who lived in the South. As shown in Table 4.57, participants who lived in the Northeast, South, and West saw a practitioner for chiropractic or osteopathic manipulation less than participants who lived in the Midwest. The Cramér’s statistic is .072 out of a possible maximum value of 1; which indicates no meaningful association between region and the use of a practitioner for chiropractic or osteopathic manipulation.

Table 4.57

Significant Interaction Between Region and Chiropractic or Osteopathic Manipulation Among a National Sample of Adults (N= 34,525)

		Saw a practitioner for chiropractic or osteopathic manipulation, past 12 months			
		Yes	No	Total	
Region	Northeast	Count	419	818	1237
		% within Region	33.9%	66.1%	100.0%
	Midwest	Count	855	1238	2093
		% within Region	40.9%	59.1%	100.0%
	South	Count	690	1458	2148
		% within Region	32.1%	67.9%	100.0%
	West	Count	821	1603	2424
		% within Region	33.9%	66.1%	100.0%
Total		Count	2785	5117	7902
		% within Region	35.2%	64.8%	100.0%

*p <.001 due to large sample size and multiple testing

Note. Some predictors do not add up to total sample due to missing values.

Seventy-nine percent of participants who lived in the Northeast used multi-vitamin or mineral supplements compared to 75% who lived in the Midwest. Table 4.58 indicates that participants who lived in the Midwest used multi-vitamin or mineral supplements less than participants who lived in the Northeast, South, and West. The Cramér’s statistic is .028 out of a possible maximum value of 1; which indicates no meaningful association between region and the use of multi-vitamin or mineral supplements.

Table 4.58

Significant Interaction Between Region and Multi-vitamin or Mineral Supplements Among a National Sample of Adults (N= 34,525)

		Taken multi-vitamins or multi-minerals in past 12 months			
		Yes	No	Total	
Region	Northeast	Count	2919	795	3714
		% within Region	78.6%	21.4%	100.0%
	Midwest	Count	3617	1202	4819
		% within Region	75.1%	24.9%	100.0%
	South	Count	5947	1746	7693
		% within Region	77.3%	22.7%	100.0%
	West	Count	5010	1439	6449
		% within Region	77.7%	22.3%	100.0%
Total		Count	17493	5182	22675
		% within Region	77.1%	22.9%	100.0%

*p <.001 due to large sample size and multiple testing

Note. Some predictors do not add up to total sample due to missing values.

Ten percent of participants who lived in the Northeast practiced yoga, tai chi, or qi gong compared to 7% of participants who lived in the South. As shown in Table 4.59, participants who lived in the Midwest and South used yoga, tai chi, or qi gong less than participants who lived in the Northeast and West. The Cramér’s statistic is .074 out of a possible maximum value of 1; which indicates no meaningful association between region and the use of yoga, tai chi, and qi gong.

Table 4.59

Significant Interaction Between Region and Yoga, Tai Chi, and Qi gong Among a National Sample of Adults (N= 34,525)

		Yoga, Tai Chi, and Qi gong		Total	
		None	One or More		
Region	Northeast	Count	5189	585	5774
		% within Region	89.9%	10.1%	100.0%
	Midwest	Count	6545	648	7193
		% within Region	91.0%	9.0%	100.0%
	South	Count	11672	864	12536
		% within Region	93.1%	6.9%	100.0%
	West	Count	7914	1108	9022
		% within Region	87.7%	12.3%	100.0%
Total		Count	31320	3205	34525
		% within Region	90.7%	9.3%	100.0%

*p <.001 due to large sample size and multiple testing

Three percent of participants who lived in the West used one or more traditional healers. Table 4.60 indicates that participants who lived in the West used one or more traditional healers than participants who lived in the Northeast, Midwest, and South. The Cramér’s statistic is .075 out of a possible maximum value of 1; which indicates no meaningful association between region and the use of one or more traditional healers.

Table 4.60

Significant Interaction Between Region and Traditional Healers Among a National Sample of Adults (N= 34,525)

		Traditional Healers		Total	
		None	One or more		
Region	Northeast	Count	5720	54	5774
		% within Region	99.1%	0.9%	100.0%
	Midwest	Count	7116	76	7192
		% within Region	98.9%	1.1%	100.0%
	South	Count	12400	136	12536
		% within Region	98.9%	1.1%	100.0%
	West	Count	8732	287	9019
		% within Region	96.8%	3.2%	100.0%
Total		Count	33968	553	34521
		% within Region	98.4%	1.6%	100.0%

*p <.001 due to large sample size and multiple testing

Note. Some predictors do not add up to total sample due to missing values.

Seven percent of participants who lived in the West practiced one or more relaxation techniques compared to 3% of participants who lived in the South. As shown in Table 4.61, participants who lived in the South used one or more relaxation techniques less than participants who lived in the Northeast, Midwest, and West. The Cramér’s statistic is .063 out of a possible maximum value of 1; which indicates no meaningful association between region and the use of one or more relaxation techniques.

Table 4.61

Significant Interaction Between Region and Relaxation Techniques Among a National Sample of Adults (N= 34,525)

		Relaxation Techniques			
		None	One or more	Total	
Region	Northeast	Count	5482	292	5774
		% within Region	94.9%	5.1%	100.0%
	Midwest	Count	6863	330	7193
		% within Region	95.4%	4.6%	100.0%
	South	Count	12136	400	12536
		% within Region	96.8%	3.2%	100.0%
	West	Count	8429	593	9022
		% within Region	93.4%	6.6%	100.0%
Total		Count	32910	1615	34525
		% within Region	95.3%	4.7%	100.0%

*p <.001 due to large sample size and multiple testing

Four percent of participants who lived in the West used one or more special diets compared to 2% of participants who lived in the South. Table 4.62 indicates that participants who lived in the South used one or more special diets less than participants who lived in the Northeast, Midwest, and West. The Cramér’s statistic is .031 out of a possible maximum value of 1; which indicates no meaningful association between region and the use of one or more special diets.

Table 4.62

Significant Interaction Between Region and Special Diets Among a National Sample of Adults (N= 34,525)

		Special Diets		Total	
		None	One or more		
Region	Northeast	Count	5585	189	5774
		% within Region	96.7%	3.3%	100.0%
	Midwest	Count	6991	202	7193
		% within Region	97.2%	2.8%	100.0%
	South	Count	12235	301	12536
		% within Region	97.6%	2.4%	100.0%
	West	Count	8687	335	9022
		% within Region	96.3%	3.7%	100.0%
Total		Count	33498	1027	34525
		% within Region	97.0%	3.0%	100.0%

*p <.001 due to large sample size and multiple testing

RQ 8. How does perceived health status influence use of CAM?

Cross-tabulation was used to examine the relationship between perceived health status and CAM modalities. The following Tables present significant two-way associations for perceived need.

According to Table 4.63, 40% of participants who saw a practitioner for chiropractic or osteopathic manipulation also reported excellent health. The Cramér’s statistic is .080 out of a possible maximum value of 1; which indicates no meaningful association between reported health status and the use of a practitioner for chiropractic or osteopathic manipulation.

Table 4.63

Significant Interaction Between Perceived Health Status and Chiropractic or Osteopathic Manipulation Among a National Sample of Adults (N= 34,525)

		Saw a practitioner for chiropractic or osteopathic manipulation, past 12 months			
		Yes	No	Total	
Reported Health Status (Perceived)	Excellent	Count	766	1138	1904
		% within Reported health status	40.2%	59.8%	100.0%
	Very good	Count	966	1681	2647
		% within Reported health status	36.5%	63.5%	100.0%
	Good	Count	713	1498	2211
		% within Reported health status	32.2%	67.8%	100.0%
	Fair	Count	263	587	850
		% within Reported health status	30.9%	69.1%	100.0%
	Poor	Count	76	213	289
		% within Reported health status	26.3%	73.7%	100.0%
Total		Count	2785	5117	7902
		% within Reported health status	35.2%	64.8%	100.0%

*p <.001 due to large sample size and multiple testing

Note. Some predictors do not add up to total sample due to missing values.

Sixty percent of participants who saw a practitioner for massage also reported excellent health.

Table 4.64 indicates that the use of a practitioner for massage decreased as reported health status decreased. The Cramér’s statistic is .115 out of a possible maximum value of 1; which indicates a small meaningful association between reported health status and the use of a practitioner for massage.

Table 4.64

Significant Interaction Between Perceived Health Status and Massage Among a National Sample of Adults (N= 34,525)

		Saw a practitioner for massage, past 12 months			
		Yes	No	Total	
Reported Health Status (Perceived)	Excellent	Count	705	479	1184
		% within Reported health status	59.5%	40.5%	100.0%
	Very good	Count	800	687	1487
		% within Reported health status	53.8%	46.2%	100.0%
	Good	Count	545	568	1113
		% within Reported health status	49.0%	51.0%	100.0%
	Fair	Count	170	239	409
		% within Reported health status	41.6%	58.4%	100.0%
	Poor	Count	56	79	135
		% within Reported health status	41.5%	58.5%	100.0%
	Total	Count	2276	2053	4329
		% within Reported health status	52.6%	47.4%	100.0%

*p <.001 due to large sample size and multiple testing

Note. Some predictors do not add up to total sample due to missing values.

Seventy-nine percent of participants who used multi-vitamin or mineral supplements also reported excellent health. As shown in Table 4.65, the use of multi-vitamin or mineral supplements decreased as reported health status decreased. The Cramér’s statistic is .041 out of a possible maximum value of 1; which indicates no meaningful association between reported health status and the use of multi-vitamin or mineral supplements.

Table 4.65

Significant Interaction Between Perceived Health Status and Multi-vitamin or Mineral Supplement Among a National Sample of Adults (N= 34,525)

		Taken multi-vitamins or multi-minerals in past 12 months			
		Yes	No	Total	
Reported Health Status (Perceived)	Excellent	Count	4688	1252	5940
		% within Reported health status	78.9%	21.1%	100.0%
	Very good	Count	5793	1676	7469
		% within Reported health status	77.6%	22.4%	100.0%
	Good	Count	4733	1426	6159
		% within Reported health status	76.8%	23.2%	100.0%
	Fair	Count	1733	633	2366
		% within Reported health status	73.2%	26.8%	100.0%
	Poor	Count	538	194	732
		% within Reported health status	73.5%	26.5%	100.0%
	Total	Count	17493	5182	22675
		% within Reported health status	77.1%	22.9%	100.0%

*p <.001 due to large sample size and multiple testing

Note. Some predictors do not add up to total sample due to missing values.

According to Table 4.66, 78% of participants who used herbal or other non-vitamin supplements also reported excellent health (i.e., the use of herbal or other non-vitamin supplements decreased as reported health status decreased). The Cramér’s statistic is .054 out of a possible maximum value of 1; which indicates no meaningful association between reported health status and the use of herbal or other non-vitamin supplements.

Table 4.66

Significant Interaction Between Perceived Health Status and Herbal or Other non-Vitamin Supplements Among a National Sample of Adults (N= 34,525)

		Taken any herbal or other non-vitamin supplements in past 12 months			
			Yes	No	Total
Reported Health Status (Perceived)	Excellent	Count	1588	445	2033
		% within Reported health status	78.1%	21.9%	100.0%
	Very good	Count	2074	624	2698
		% within Reported health status	76.9%	23.1%	100.0%
	Good	Count	1577	513	2090
		% within Reported health status	75.5%	24.5%	100.0%
	Fair	Count	569	230	799
		% within Reported health status	71.2%	28.8%	100.0%
	Poor	Count	164	72	236
		% within Reported health status	69.5%	30.5%	100.0%
	Total	Count	5974	1884	7858
		% within Reported health status	76.0%	24.0%	100.0%

*p <.001 due to large sample size and multiple testing

Note. Some predictors do not add up to total sample due to missing values.

Ninety-eight percent of participants who practiced yoga, tai chi, or qi gong also reported poor health (see Table 4.67). These results indicate that practicing yoga, tai chi, or qi gong increased as reported health status decreased. The Cramér’s statistic is .070 out of a possible maximum value of 1; which indicates no meaningful association between reported health status and the use of yoga, tai chi, and qi gong.

Table 4.67

Significant Interaction Between Perceived Health Status and Yoga, Tai Chi, and Qi gong Among a National Sample of Adults (N= 34,525)

		Yoga, Tai Chi, or Qi Gong			
		None	One or more	Total	
Reported Health Status (Perceived)	Excellent	Count	7664	1194	8858
		% within Reported health status	86.5%	13.5%	100.0%
	Very good	Count	9562	1182	10744
		% within Reported health status	89.0%	11.0%	100.0%
	Good	Count	9021	615	9636
		% within Reported health status	93.6%	6.4%	100.0%
	Fair	Count	3818	181	3999
		% within Reported health status	95.5%	4.5%	100.0%
	Poor	Count	1238	32	1270
		% within Reported health status	97.5%	2.5%	100.0%
	Total	Count	31320	3205	34525
		% within Reported health status	90.7%	9.3%	100.0%

*p <.001 due to large sample size and multiple testing

Five percent of participants who used one or more relaxation techniques also reported very good health. As shown in Table 4.68, participants who reported excellent or very good health used one or more relaxation techniques more than participants who reported good, fair, or poor health. The Cramér’s statistic is .022 out of a possible maximum value of 1; which indicates no meaningful association between reported health status and the use of one or more relaxation techniques.

Table 4.68

Significant Interaction Between Perceived Health Status and Relaxation Techniques Among a National Sample of Adults (N= 34,525)

		Relaxation Techniques			
		None	One or more	Total	
Reported Health Status (Perceived)	Excellent	Count	8422	436	8858
		% within Reported health status	95.1%	4.9%	100.0%
	Very good	Count	10164	580	10744
		% within Reported health status	94.6%	5.4%	100.0%
	Good	Count	9260	376	9636
		% within Reported health status	96.1%	3.9%	100.0%
	Fair	Count	3828	171	3999
		% within Reported health status	95.7%	4.3%	100.0%
	Poor	Count	1220	50	1270
		% within Reported health status	96.1%	3.9%	100.0%
	Total	Count	32910	1615	34525
		% within Reported health status	95.3%	4.7%	100.0%

*p <.001 due to large sample size and multiple testing

One percent of participants who used one or more movement therapies also reported excellent or very good health. Table 4.69 indicated that participants who reported good, fair, or poor health used one or more movement therapies less than participants who reported excellent or very good health. The Cramér’s statistic is .046 out of a possible maximum value of 1; which indicates no meaningful association between reported health status and the use of one or more movement therapies.

Table 4.69

Significant Interaction Between Perceived Health Status and Movement Therapies Among a National Sample of Adults (N= 34,525)

		Movement Therapies			
		None	One or more	Total	
Reported Health Status (Perceived)	Excellent	Count	8785	73	8858
		% within Reported health status	99.2%	0.8%	100.0%
	Very good	Count	10677	67	10744
		% within Reported health status	99.4%	0.6%	100.0%
	Good	Count	9608	28	9636
		% within Reported health status	99.7%	0.3%	100.0%
	Fair	Count	3992	7	3999
		% within Reported health status	99.8%	0.2%	100.0%
	Poor	Count	1269	1	1270
		% within Reported health status	99.9%	0.1%	100.0%
	Total	Count	34348	177	34525
		% within Reported health status	99.5%	0.5%	100.0%

*p <.001 due to large sample size and multiple testing

RQ 9. How does health status evaluated by a health care provider influence use of CAM modalities?

Cross-tabulation was used to examine the relationship between evaluated health status (diagnosed by a health care provider) and CAM modalities. The following Tables provide significant two-way associations for evaluated health.

According to Table 4.70, 30% of participants who saw a practitioner for chiropractic or osteopathic manipulation also reported being diagnosed with 1-3 chronic health conditions. The Cramér’s statistic is .065 out of a possible maximum value of 1; which indicates no meaningful association between evaluated health status and the use of a practitioner for chiropractic or osteopathic manipulation.

Table 4.70

Significant Interaction Between Evaluated Health Status and Chiropractic or Osteopathic Manipulation Among a National Sample of Adults (N= 34,525)

		Saw A Practitioner For Chiropractic Or Osteopathic Manipulation, Past 12 Months			
			Yes	No	Total
Evaluated Health (Diagnosed)	None	Count	2159	3659	5818
		% within Evaluated Health	37.1%	62.9%	100.0%
	1-3 chronic health conditions	Count	626	1458	2084
		% within Evaluated Health	30.0%	70.0%	100.0%
Total		Count	2785	5117	7902
		% within Evaluated Health	35.2%	64.8%	100.0%

*p <.001 due to large sample size and multiple testing

Note. Some predictors do not add up to total sample due to missing values.

According to Table 4.71, 46% of participants who saw a practitioner for massage also reported being diagnosed with one to three chronic health conditions. The Cramér’s statistic is .069 out of a possible maximum value of 1; which indicates no meaningful association between evaluated health status and the use of a practitioner for massage.

Table 4.71

Significant Interaction Between Evaluated Health Status and Massage Among a National Sample of Adults (N= 34,525)

		Saw A Practitioner For Massage, Past 12 Months			
			Yes	No	Total
Evaluated Health (Diagnosed)	None	Count	1831	1533	3364
		% within Evaluated Health	54.4%	45.6%	100.0%
	1-3 chronic health conditions	Count	445	520	965
		% within Evaluated Health	46.1%	53.9%	100.0%
Total		Count	2276	2053	4329
		% within Evaluated Health	52.6%	47.4%	100.0%

*p <.001 due to large sample size and multiple testing

Note. Some predictors do not add up to total sample due to missing values.

Table 4.72 indicates that 22% of participants who saw a practitioner for acupuncture also reported being diagnosed with 1-3 chronic health conditions. The Cramér’s statistic is .065 out of a possible maximum value of 1; which indicates no meaningful association between evaluated health status and the use of a practitioner for acupuncture.

Table 4.72

Significant Interaction Between Evaluated Health Status and Acupuncture Among a National Sample of Adults (N= 34,525)

		Saw A Practitioner For Acupuncture, Past 12 Months			
			Yes	No	Total
Evaluated Health (Diagnosed)	None	Count	439	1096	1535
		% within Evaluated Health	28.6%	71.4%	100.0%
	1-3 chronic health conditions	Count	133	467	600
		% within Evaluated Health	22.2%	77.8%	100.0%
Total		Count	572	1563	2135
		% within Evaluated Health	26.8%	73.2%	100.0%

*p <.001 due to large sample size and multiple testing

Note. Some predictors do not add up to total sample due to missing values.

According to Table 4.73, 78% of participants who used multi-vitamin or multi-minerals also reported being diagnosed with 1-3 chronic health conditions. The Cramér’s statistic is .013 out of a possible maximum value of 1; which indicates no meaningful association between evaluated health status and the use of multi-vitamin or mineral supplements.

Table 4.73

Significant Interaction Between Evaluated Health Status and Multi-vitamin or Mineral Supplements Among a National Sample of Adults (N= 34,525)

		Taken Multi-Vitamins Or Multi-Minerals In Past 12 Months			
			Yes	No	Total
Evaluated Health (Diagnosed)	None	Count	13317	4015	17332
		% within Evaluated Health	76.8%	23.2%	100.0%
	1-3 chronic health conditions	Count	4176	1167	5343
		% within Evaluated Health	78.2%	21.8%	100.0%
Total		Count	17493	5182	22675
		% within Evaluated Health	77.1%	22.9%	100.0%

*p <.001 due to large sample size and multiple testing

Note. Some predictors do not add up to total sample due to missing values.

Seventy six percent (76%) of participants who used herbal or other non-vitamin supplements also reported being diagnosed with 1-3 chronic health conditions (see Table 4.74). The Cramér's statistic is .005 out of a possible maximum value of 1; which indicates no meaningful association between evaluated health status and the use of a herbal or other non-vitamin or mineral supplements.

Table 4.74

Significant Interaction Between Evaluated Health Status and Herbal or Other Non-vitamin Supplements Among a National Sample of Adults (N= 34,525)

		Taken Any Herbal Or Other Non-Vitamin Supplements In Past 12 Months			
			Yes	No	Total
Evaluated Health (Diagnosed)	None	Count	4524	1417	5941
		% within Evaluated Health	76.1%	23.9%	100.0%
	1-3 chronic health conditions	Count	1450	467	1917
		% within Evaluated Health	75.6%	24.4%	100.0%
Total		Count	5974	1884	7858
		% within Evaluated Health	76.0%	24.0%	100.0%

*p <.001 due to large sample size and multiple testing

Note. Some predictors do not add up to total sample due to missing values.

According to Table 4.75, 5% of participants who practiced yoga tai chi, or qi gong also reported being diagnosed with 1-3 chronic health conditions. The Cramér’s statistic is .075 out of a possible maximum value of 1; which indicates no meaningful association between evaluated health status and the use of yoga, tai chi, and qi gong.

Table 4.75

Significant Interaction Between Evaluated Health Status and Yoga, Tai Chi, and Qi gong Among a National Sample of Adults (N= 34,525)

		Yoga, Tai Chi, And Qi Gong, Past 12 Months			
			One or more	Total	
Evaluated Health (Diagnosed)	None	Count	23743	2278	26521
		% within Evaluated Health	89.5%	10.5%	100.0%
	1-3 chronic health conditions	Count	7577	427	8004
		% within Evaluated Health	94.7%	5.3%	100.0%
Total		Count	31320	3205	34525
		% within Evaluated Health	90.7%	9.3%	100.0%

*p <.001 due to large sample size and multiple testing

Table 4.76 indicates that less than one percent of participants who used one or more movement therapies also reported being diagnosed with 1-3 chronic health conditions. The Cramér's statistic is .011 out of a possible maximum value of 1; which indicates no meaningful association between evaluated health status and the use of one or more movement therapies.

Table 4.76

Significant Interaction Between Evaluated Health Status and Movement Therapies Among a National Sample of Adults (N= 34,525)

		Movement Therapies, Past 12 Months			
			None	One or more	Total
Evaluated Health (Diagnosed)	None	Count	26374	147	26521
		% within Evaluated Health	99.4%	0.6%	100.0%
	1-3 chronic health conditions	Count	7974	30	8004
		% within Evaluated Health	99.6%	0.4%	100.0%
Total		Count	34348	177	34525
		% within Evaluated Health	99.5%	0.5%	100.0%

*p <.001 due to large sample size and multiple testing

RQ 10. Which individual health behaviors (e.g., smoking status, physical activity, BMI, and Alcohol status) influence use of CAM?

Log-linear analysis was used to examine two-way (partial) and three-way relationships/associations among the health behavior variables of interests. The following Tables display significant two-way associations for the predisposing variables of interest. Figure 4.2 is a significant three-way interaction for the health behavior variables of interest.

Fifty-six percent of participants who saw a practitioner for massage never smoked compared to 43% who were current smokers. As shown in Table 4.77, participants who were current smokers used a practitioner for massage less than participants who were former smokers and participants who never smoked. The Cramér's statistic is .092 out of a possible maximum value of 1; which indicates no meaningful association between smoking status and the use of a practitioner for massage.

Table 4.77

Significant Interaction Between Smoking Status and Massage Among a National Sample of Adults (N= 34,525)

		Saw a practitioner for massage, past 12 months			
		Yes	No	Total	
Smoking Status	Current	Count	279	376	655
		% within Smoking Status	42.6%	57.4%	100.0%
	Former	Count	608	575	1183
		% within Smoking Status	51.4%	48.6%	100.0%
	Never smoked	Count	1386	1101	2487
		% within Smoking Status	55.7%	44.3%	100.0%
Total		Count	2273	2052	4325
		% within Smoking Status	52.6%	47.4%	100.0%

*p <.001 due to large sample size and multiple testing

Note. Some predictors do not add up to total sample due to missing values.

Ten percent of participants who were former smokers practiced yoga, tai chi, or qi gong compared to 7% of current smokers. Table 4.78 indicates that participants who were current smokers practiced yoga, tai chi, or qi gong less than participants who were former smokers or participants who never smoked. The Cramér’s statistic is .037 out of a possible maximum value of 1; which indicates no meaningful association between smoking status and the use of yoga, tai chi, and qi gong.

Table 4.78

Significant Interaction Between Smoking Status and Yoga, Tai Chi, and Qi gong Among a National Sample of Adults (N= 34,525)

		Yoga, Tai Chi, and Qi gong			
		None	One or More	Total	
Smoking Status	Current	Count	5978	458	6436
		% within Smoking Status	92.9%	7.1%	100.0%
	Former	Count	6828	756	7584
		% within Smoking Status	90.0%	10.0%	100.0%
Never smoked	Count	18249	1987	20236	
	% within Smoking Status	90.2%	9.8%	100.0%	
Total	Count	31055	3201	34256	
	% within Smoking Status	90.7%	9.3%	100.0%	

*p <.001 due to large sample size and multiple testing

Note. Some predictors do not add up to total sample due to missing values.

One percent of participants who were former smokers or never smoked used one or more movement therapies. As shown in Table 4.79, participants who were current smokers used one or more movement therapies less than participants who were former smokers or participants who never smoked. The Cramér’s statistic is .014 out of a possible maximum value of 1; which indicates no meaningful association between smoking status and the use of one or more movement therapies.

Table 4.79

Significant Interaction Between Smoking Status and Movement Therapies Among a National Sample of Adults (N= 34,525)

		Movement Therapies			
		None	One or more	Total	
Smoking Status	Current	Count	6416	20	6436
		% within Smoking Status	99.7%	0.3%	100.0%
	Former	Count	7545	39	7584
		% within Smoking Status	99.5%	0.5%	100.0%
	Never smoked	Count	20118	118	20236
		% within Smoking Status	99.4%	0.6%	100.0%
Total		Count	34079	177	34256
		% within Smoking Status	99.5%	0.5%	100.0%

*p <.001 due to large sample size and multiple testing

Note. Some predictors do not add up to total sample due to missing values.

Seventy-eight percent of participants who were former smokers used herbal or other non-vitamin supplements compared to 72% of participants who were current smokers. Table 4.80 indicates that participants who were current smokers used herbal or other non-vitamin supplements less than participants who were former smokers or participants who never smoked. The Cramér's statistic is .050 out of a possible maximum value of 1; which indicates no meaningful association between smoking status and the use of herbal or other non-vitamin supplements.

Table 4.80

Significant Interaction Between Smoking Status and Herbal or Other Non-vitamin Supplements Among a National Sample of Adults (N= 34,525)

		Taken any herbal or other non- vitamin supplements in past 12 months			
		Yes	No	Total	
Smoking Status	Current	Count	904	360	1264
		% within Smoking Status	71.5%	28.5%	100.0%
Former	Count	1688	471	2159	
	% within Smoking Status	78.2%	21.8%	100.0%	
Never smoked	Count	3377	1050	4427	
	% within Smoking Status	76.3%	23.7%	100.0%	
Total	Count	5969	1881	7850	
	% within Smoking Status	76.0%	24.0%	100.0%	

*p <.001 due to large sample size and multiple testing

Note. Some predictors do not add up to total sample due to missing values.

Seventy-eight percent of participants who were former smokers or never smoked also used multi-vitamin or mineral supplements. As shown in Table 4.81, participants who were current smokers used multi-vitamin or mineral supplement less than participants who were former smokers or participants who never smoked. The Cramér’s statistic is .060 out of a possible maximum value of 1; which indicates no meaningful association between smoking status and the use of multi-vitamin or mineral supplements.

Table 4.81

Significant Interaction Between Smoking Status and Multi-vitamin or Multi-Mineral Supplements Among a National Sample of Adults (N= 34,525)

		Taken multi-vitamins or multi-minerals in past 12 months			
		Yes	No	Total	
Smoking Status	Current	Count	2744	1090	3834
		% within Smoking Status	71.6%	28.4%	100.0%
	Former	Count	4282	1184	5466
		% within Smoking Status	78.3%	21.7%	100.0%
	Never smoked	Count	10441	2897	13338
		% within Smoking Status	78.3%	21.7%	100.0%
Total		Count	17467	5171	22638
		% within Smoking Status	77.2%	22.8%	100.0%

*p <.001 due to large sample size and multiple testing

Note. Some predictors do not add up to total sample due to missing values.

Four percent of participants who were former smokers also used one or more special diets compared to 2% of current smokers (see Table 4.82). Participants who were current smokers used special diets less than participants who were former smokers or participants who never smoked. The Cramér’s statistic is .026 out of a possible maximum value of 1; which indicates no meaningful association between smoking status and the use of one or more special diets.

Table 4.82

Significant Interaction Between Smoking Status and Special Diets Among a National Sample of Adults (N= 34,525)

		Special Diets			
		None	One or more	Total	
Smoking Status	Current	Count	6290	146	6436
		% within Smoking Status	97.7%	2.3%	100.0%
	Former	Count	7305	279	7584
		% within Smoking Status	96.3%	3.7%	100.0%
	Never smoked	Count	19635	601	20236
		% within Smoking Status	97.0%	3.0%	100.0%
Total		Count	33230	1026	34256
		% within Smoking Status	97.0%	3.0%	100.0%

*p <.001 due to large sample size and multiple testing

Note. Some predictors do not add up to total sample due to missing values.

Fifty-four percent of participants who saw a practitioner for massage, also reported engaging in more than once a week of leisure/moderate physical activity and less than once a week of leisure/moderate physical activity. As shown in Table 4.83, participants who did not engage in physical activity used a practitioner for massage less than participants who engaged in physical activity. The Cramér’s statistic is .062 out of a possible maximum value of 1; which indicates no meaningful association between physical activity and the use of a practitioner for massage.

Table 4.83

Significant Interaction Between Physical Activity and Massage Among a National Sample of Adults (N= 34,525)

		Saw a practitioner for massage, past 12 months			
		Yes	No	Total	
Physical Activity	Less than once a week	Count	71	61	132
		% within Physical Activity	53.8%	46.2%	100.0%
	More than once a week	Count	1652	1390	3042
		% within Physical Activity	54.3%	45.7%	100.0%
	No activity	Count	515	577	1092
		% within Physical Activity	47.2%	52.8%	100.0%
Total	Count	2238	2028	4266	
	% within Physical Activity	52.5%	47.5%	100.0%	

*p <.001 due to large sample size and multiple testing

Note. Some predictors do not add up to total sample due to missing values.

Thirteen percent of participants who practiced yoga, tai chi, or qi gong engaged in more than once a week of physical activity compared to 4% of participants who engaged in no activity.

Table 4.84 indicates that participants who engaged in no physical activity practiced yoga, tai chi, or qi gong less than participants who engaged in physical activity. The Cramér’s statistic is .162 out of a possible maximum value of 1; which indicates a small meaningful association between physical activity and the use of yoga, tai chi, and qi gong.

Table 4.84

Significant Interaction Between Physical Activity and Yoga, Tai Chi, and Qi gong Among a National Sample of Adults (N= 34,525)

		Yoga, Tai Chi, and Qi gong			
			None	One or More	Total
Physical Activity	Less than once a week	Count	634	72	706
		% within Physical Activity	89.8%	10.2%	100.0%
	More than once a week	Count	16467	2554	19021
		% within Physical Activity	86.6%	13.4%	100.0%
	No activity	Count	13544	535	14079
		% within Physical Activity	96.2%	3.8%	100.0%
Total	Count	30645	3161	33806	
	% within Physical Activity	90.6%	9.4%	100.0%	

*p <.001 due to large sample size and multiple testing

Note. Some predictors do not add up to total sample due to missing values.

One percent of participants who engaged in more than once a week of physical activity also used one or more movement therapies. As shown in Table 4.85, participants who engaged in more than once a week of physical activity used one or more movement therapies more than participants who engaged in less than once a week of physical activity and participants who did not engaged in any physical activity. The Cramér’s statistic is .046 out of a possible maximum value of 1; which indicates no meaningful association between physical activity and the use of one or more movement therapies.

Table 4.85

Significant Interaction Between Physical Activity and Movement Therapies Among a National Sample of Adults (N= 34,525)

		Movement Therapies			
		None	One or more	Total	
Physical Activity	Less than once a week	Count	703	3	706
		% within Physical Activity	99.6%	0.4%	100.0%
	More than once a week	Count	18868	153	19021
		% within Physical Activity	99.2%	0.8%	100.0%
	No activity	Count	14061	18	14079
		% within Physical Activity	99.9%	0.1%	100.0%
Total	Count	33632	174	33806	
	% within Physical Activity	99.5%	0.5%	100.0%	

*p <.001 due to large sample size and multiple testing

Note. Some predictors do not add up to total sample due to missing values.

Seventy-seven percent of participants who engaged in more than once a week of physical activity also used herbal or other non-vitamin supplements (see Table 4.86). Participants who engaged in less than once a week of physical activity used herbal or other non-vitamin supplements less than participants who engaged in more than once a week of physical activity and participants who engaged in no physical activity. The Cramér’s statistic is .050 out of a possible maximum value of 1; which indicates no meaningful association between physical activity and the use of herbal or other non-vitamin supplements.

Table 4.86

Significant Interaction Between Physical Activity and Herbal or Other Non-vitamin Supplements Among a National Sample of Adults (N= 34,525)

		Taken any herbal or other non-vitamin supplements in past 12 months			
			Yes	No	Total
Physical Activity	Less than once a week	Count	163	68	231
		% within Physical Activity	70.6%	29.4%	100.0%
	More than once a week	Count	4136	1211	5347
		% within Physical Activity	77.4%	22.6%	100.0%
	No activity	Count	1581	583	2164
		% within Physical Activity	73.1%	26.9%	100.0%
Total	Count	5880	1862	7742	
	% within Physical Activity	75.9%	24.1%	100.0%	

*p <.001 due to large sample size and multiple testing

Note. Some predictors do not add up to total sample due to missing values.

Seventy-nine percent of participants who engaged in more than once a week of physical activity also used multi-vitamin or mineral supplements. As shown in Table 4.87, participants who engaged in less than once a week of physical activity used multi-vitamin or mineral supplements less than participants who engaged in more than once a week of physical activity and participants who engaged in no physical activity. The Cramér’s statistic is .054 out of a possible maximum value of 1; which indicates no meaningful association between physical activity and the use of multi-vitamin or mineral supplements.

Table 4.87

Significant Interaction Between Physical Activity and Multi-vitamin or Multi-mineral Supplements Among a National Sample of Adults (N= 34,525)

			Taken multi-vitamins or multi-minerals in past 12 months		
			Yes	No	Total
Physical Activity	Less than once a week	Count	370	140	510
		% within Physical Activity	72.5%	27.5%	100.0%
	More than once a week	Count	11071	2973	14044
		% within Physical Activity	78.8%	21.2%	100.0%
	No activity	Count	5806	2013	7819
		% within Physical Activity	74.3%	25.7%	100.0%
Total		Count	17247	5126	22373
		% within Physical Activity	77.1%	22.9%	100.0%

*p <.001 due to large sample size and multiple testing

Note. Some predictors do not add up to total sample due to missing values.

Seven percent of participants who engaged in more than once a week of physical activity practiced one or more relaxation techniques compared to 2% of participants who engaged in no

activity. Table 4.88 indicates that participants who engaged in no physical activity used one or more relaxation techniques less than participants who engaged in physical activity. The Cramér's statistic is .100 out of a possible maximum value of 1; which indicates a small meaningful association between physical activity and the use of one or more relaxation techniques.

Table 4.88

Significant Interaction Between Physical Activity and Relaxation Techniques Among a National Sample of Adults (N= 34,525)

		Relaxation Techniques			
		None	One or more	Total	
Physical Activity	Less than once a week	Count	665	41	706
		% within Physical Activity	94.2%	5.8%	100.0%
	More than once a week	Count	17782	1239	19021
		% within Physical Activity	93.5%	6.5%	100.0%
	No activity	Count	13770	309	14079
		% within Physical Activity	97.8%	2.2%	100.0%
Total		Count	32217	1589	33806
		% within Physical Activity	95.3%	4.7%	100.0%

*p <.001 due to large sample size and multiple testing

Note. Some predictors do not add up to total sample due to missing values.

Four percent of participants who engaged in less than once a week of physical activity and more than once a week of physical activity also used one or more special diets (see Table 4.89).

Participants who engaged in no physical activity used one or more special diets less than participants who engaged in physical activity. The Cramér's statistic is .059 out of a possible maximum value of 1; which indicates no meaningful association between physical activity and the use of one or more special diets.

Table 4.89

Significant Interaction Between Physical Activity and Special Diets Among a National Sample of Adults (N= 34,525)

		Special Diets		Total	
		None	One or more		
Physical Activity	Less than once a week	Count	681	25	706
		% within Physical Activity	96.5%	3.5%	100.0%
	More than once a week	Count	18284	737	19021
		% within Physical Activity	96.1%	3.9%	100.0%
	No activity	Count	13823	256	14079
		% within Physical Activity	98.2%	1.8%	100.0%
Total	Count	32788	1018	33806	
	% within Physical Activity	97.0%	3.0%	100.0%	

*p <.001 due to large sample size and multiple testing

Note. Some predictors do not add up to total sample due to missing values.

Thirty-eight percent of participants who had a BMI classified as healthy (18.5-24.9) saw a practitioner for chiropractic or osteopathic manipulation compared to 27% of participants who had a BMI classified as underweight (<18.5). As shown in Table 4.90, the use of a practitioner for chiropractic or osteopathic manipulation increased as BMI decreased, with the exception of participants who had a BMI classified as unhealthy (>30). The Cramér’s statistic is .053 out of a possible maximum value of 1; which indicates no meaningful association between BMI and the use of a practitioner for chiropractic or osteopathic manipulation.

Table 4.90

Significant Interaction Between Body Mass Index and Chiropractic or Osteopathic Manipulation Among a National Sample of Adults (N= 34,525)

		Saw a practitioner for chiropractic or osteopathic manipulation, past 12 months			
			Yes	No	Total
Body Mass Index (BMI)	<18.5	Count	29	79	108
		% within Body Mass Index (BMI)	26.9%	73.1%	100.0%
18.5-24.9		Count	939	1509	2448
		% within Body Mass Index (BMI)	38.4%	61.6%	100.0%
25-29		Count	815	1474	2289
		% within Body Mass Index (BMI)	35.6%	64.4%	100.0%
>30		Count	823	1693	2516
		% within Body Mass Index (BMI)	32.7%	67.3%	100.0%
Total		Count	2606	4755	7361
		% within Body Mass Index (BMI)	35.4%	64.6%	100.0%

*p <.001 due to large sample size and multiple testing

Note. Some predictors do not add up to total sample due to missing values.

Six percent of participants who had a BMI classified as healthy (18.5-24.9) practiced one or more relaxation techniques compared to 4% of participants who had a BMI classified as underweight (<18.5) and obese (>30). Table 4.91 indicates that the use of one or more relaxation techniques increased as BMI decreased, with the exception of participants who had a BMI classified as unhealthy (<18.5). The Cramér’s statistic is .037 out of a possible maximum value of 1; which indicates no meaningful association between BMI and the use of one or more relaxation techniques.

Table 4.91

Significant Interaction Between Body Mass Index and Relaxation Techniques Among a National Sample of Adults (N= 34,525)

		Relaxation Techniques			
			None	One or more	Total
Body Mass Index (BMI)	<18.5	Count	552	25	577
		% within Body Mass Index (BMI)	95.7%	4.3%	100.0%
	18.5-24.9	Count	10644	646	11290
		% within Body Mass Index (BMI)	94.3%	5.7%	100.0%
	25-29	Count	9085	431	9516
		% within Body Mass Index (BMI)	95.5%	4.5%	100.0%
	>30	Count	10509	419	10928
		% within Body Mass Index (BMI)	96.2%	3.8%	100.0%
Total		Count	30790	1521	32311
		% within Body Mass Index (BMI)	95.3%	4.7%	100.0%

*p <.001 due to large sample size and multiple testing

Note. Some predictors do not add up to total sample due to missing values.

One percent of participants who had a BMI classified as underweight (<18.5) and 1% of participants who had a BMI classified as healthy (18.5-24.9) used one or more movement therapies (see Table 4.92). These results show that the use of one more movement therapies decreased as BMI increased. The Cramér’s statistic is .036 out of a possible maximum value of 1; which indicates no meaningful association between BMI and the use of one or more movement therapies.

Table 4.92

Significant Interaction Between Body Mass Index and Movement Therapies Among a National Sample of Adults (N= 34,525)

		Movement Therapies		Total	
		None	One or more		
Body Mass Index (BMI)	<18.5	Count	573	4	577
		% within Body Mass Index (BMI)	99.3%	0.7%	100.0%
	18.5-24.9	Count	11191	99	11290
		% within Body Mass Index (BMI)	99.1%	0.9%	100.0%
	25-29	Count	9482	34	9516
		% within Body Mass Index (BMI)	99.6%	0.4%	100.0%
	>30	Count	10895	33	10928
		% within Body Mass Index (BMI)	99.7%	0.3%	100.0%
Total		Count	32141	170	32311
		% within Body Mass Index (BMI)	99.5%	0.5%	100.0%

*p <.001 due to large sample size and multiple testing

Note. Some predictors do not add up to total sample due to missing values.

Seventy-eight percent of participants who had a BMI classified as healthy (18.5-24.9) and 78% of participants who had a BMI classified as overweight (25-29) used multi-vitamin or mineral supplements. As shown in Table 4.93, the use of multi-vitamin or mineral supplements increased as BMI decreased with the exception of participants who had a BMI classified as <18.5. The Cramér’s statistic is .031 out of a possible maximum value of 1; which indicates no meaningful association between BMI and the use of multi-vitamin or mineral supplements.

Table 4.93

Significant Interaction Between Body Mass Index and Multi-vitamins or Multi-mineral Supplements Among a National Sample of Adults (N= 34,525)

		Taken multi-vitamins or multi-minerals in past 12 months			
		Yes	No	Total	
Body Mass Index (BMI)	<18.5	Count	294	87	381
		% within Body Mass Index (BMI)	77.2%	22.8%	100.0%
18.5-24.9		Count	6027	1696	7723
		% within Body Mass Index (BMI)	78.0%	22.0%	100.0%
25-29		Count	4943	1410	6353
		% within Body Mass Index (BMI)	77.8%	22.2%	100.0%
>30		Count	5114	1693	6807
		% within Body Mass Index (BMI)	75.1%	24.9%	100.0%
Total		Count	16378	4886	21264
		% within Body Mass Index (BMI)	77.0%	23.0%	100.0%

*p <.001 due to large sample size and multiple testing

Note. Some predictors do not add up to total sample due to missing values.

Thirty-seven percent of participants who were current infrequent/light drinkers also reported seeing a practitioner for chiropractic or osteopathic manipulation compared to 28% of participants who were former drinkers. Table 4.94 indicates that participants who were former drinkers used a practitioner for chiropractic or osteopathic manipulation less than participants who were lifetime abstainers, current infrequent/light drinkers, or participants who were current moderate/heavy drinkers. The Cramér’s statistic is .069 out of a possible maximum value of 1; which indicates no meaningful association between alcohol status and the use of a practitioner for chiropractic or osteopathic manipulation.

Table 4.94

Significant Interaction Between Alcohol Status and Chiropractic or Osteopathic Manipulation Among a National Sample of Adults (N= 34,525)

		Saw a practitioner for chiropractic or osteopathic manipulation, past 12 months		
		Yes	No	Total
Alcohol Status	Lifetime abstainer	Count 370	645	1015
		% within Alcohol Status 36.5%	63.5%	100.0%
	Former	Count 371	946	1317
		% within Alcohol Status 28.2%	71.8%	100.0%
	Current infrequent/light	Count 1383	2322	3705
		% within Alcohol Status 37.3%	62.7%	100.0%
	Current moderate/heavy	Count 644	1150	1794
		% within Alcohol Status 35.9%	64.1%	100.0%
Total		Count 2768	5063	7831
		% within Alcohol Status 35.3%	64.7%	100.0%

*p <.001 due to large sample size and multiple testing

Note. Some predictors do not add up to total sample due to missing values.

Fifty-six percent of participants who were current moderate/heavy drinkers also reported seeing a practitioner for massage compared to 41% of participants who were former drinkers. As shown in Table 4.95, participants who were former drinkers used a practitioner massage less than participants who were lifetime abstainers, current infrequent/light drinkers, and participants who were current moderate/heavy drinkers. The Cramér’s statistic is .105 out of a possible maximum value of 1; which indicates a small meaningful association between alcohol status and the use of a practitioner for massage.

Table 4.95

Significant Interaction Between Alcohol Status and Massage Among a National Sample of Adults (N= 34,525)

		Saw a practitioner for massage, past 12 months			
		Yes	No	Total	
Alcohol Status	Lifetime abstainer	Count	215	242	457
		% within Alcohol Status	47.0%	53.0%	100.0%
	Former	Count	243	345	588
		% within Alcohol Status	41.3%	58.7%	100.0%
	Current infrequent/ light	Count	1227	998	2225
		% within Alcohol Status	55.1%	44.9%	100.0%
	Current moderate/ heavy	Count	579	447	1026
		% within Alcohol Status	56.4%	43.6%	100.0%
Total		Count	2264	2032	4296
		% within Alcohol Status	52.7%	47.3%	100.0%

*p <.001 due to large sample size and multiple testing

Note. Some predictors do not add up to total sample due to missing values.

Seventy-eight percent of participants who were lifetime abstainers and current infrequent/light drinkers used multi-vitamin or mineral supplements compared to 75% who were current moderate/heavy drinkers. Table 4.96 indicates that participants who were current moderate/heavy drinkers used multi-vitamins or mineral supplements less than participants who were current infrequent/light drinkers, participants who were former drinkers, and lifetime abstainers. The Cramér’s statistic is .031 out of a possible maximum value of 1; which indicates no meaningful association between alcohol status and the use of multi-vitamin or mineral supplements.

Table 4.96

Significant Interaction Between Alcohol Status and Multi-vitamins or Multi-mineral Supplements Among a National Sample of Adults (N= 34,525)

		Taken multi-vitamins or multi-minerals in past 12 months			
		Yes	No	Total	
Alcohol Status	Lifetime abstainer	Count	3080	896	3976
		% within Alcohol Status	77.5%	22.5%	100.0%
	Former	Count	2749	852	3601
		% within Alcohol Status	76.3%	23.7%	100.0%
	Current infrequent/light	Count	7965	2209	10174
		% within Alcohol Status	78.3%	21.7%	100.0%
	Current moderate/heavy	Count	3520	1177	4697
		% within Alcohol Status	74.9%	25.1%	100.0%
Total		Count	17314	5134	22448
		% within Alcohol Status	77.1%	22.9%	100.0%

*p <.001 due to large sample size and multiple testing

Note. Some predictors do not add up to total sample due to missing values.

Six percent of participants who were current infrequent/light drinkers and current moderate/heavy drinkers practiced one or more relaxation techniques compared to 2% of lifetime abstainers (see Table 4.97). Participants who were lifetime abstainers used one or more relaxation techniques less than participants who were former drinkers, current infrequent/light drinkers, and current moderate/heavy drinkers. The Cramér’s statistic is .072 out of a possible maximum value of 1; which indicates no meaningful association between alcohol status and the use of one or more relaxation techniques.

Table 4.97

Significant Interaction Between Alcohol Status and Relaxation Techniques Among a National Sample of Adults (N= 34,525)

		Relaxation Techniques			
		None	One or more	Total	
Alcohol Status	Lifetime abstainer	Count	7296	155	7451
		% within Alcohol Status	97.9%	2.1%	100.0%
	Former	Count	5171	229	5400
		% within Alcohol Status	95.8%	4.2%	100.0%
	Current infrequent/light	Count	13453	814	14267
		% within Alcohol Status	94.3%	5.7%	100.0%
	Current moderate/heavy	Count	6274	401	6675
		% within Alcohol Status	94.0%	6.0%	100.0%
Total		Count	32194	1599	33793
		% within Alcohol Status	95.3%	4.7%	100.0%

*p <.001 due to large sample size and multiple testing

Note. Some predictors do not add up to total sample due to missing values.

Two percent of participants who were former drinkers, current infrequent/light drinkers, and current moderate/heavy drinkers used one or more traditional healers. As shown in Table 4.98, participants who were lifetime abstainers used one or more traditional healers less than participants who were former drinkers, current infrequent/light drinkers, or current moderate/heavy drinkers. The Cramér’s statistic is .028 out of a possible maximum value of 1; which indicates no meaningful association between alcohol status and the use of one or more traditional healers.

Table 4.98

Significant Interaction Between Alcohol Status and Traditional Healers Among a National Sample of Adults (N= 34,525)

		Traditional Healers		Total	
		None	One or more		
Alcohol Status	Lifetime abstainer	Count	7378	73	7451
		% within Alcohol Status	99.0%	1.0%	100.0%
	Former	Count	5296	103	5399
		% within Alcohol Status	98.1%	1.9%	100.0%
	Current infrequent/light	Count	14018	246	14264
		% within Alcohol Status	98.3%	1.7%	100.0%
	Current moderate/heavy	Count	6548	127	6675
		% within Alcohol Status	98.1%	1.9%	100.0%
Total		Count	33240	549	33789
		% within Alcohol Status	98.4%	1.6%	100.0%

*p <.001 due to large sample size and multiple testing

Note. Some predictors do not add up to total sample due to missing values.

Four percent of participants who were current moderate/heavy drinkers used one or more special diets compared to 2% of participants who were lifetime abstainers. Table 4.99 indicates that participants who used one or more special diets less than participants who were former drinkers, current infrequent/light drinkers, and current moderate/heavy drinkers. The Cramér's statistic is .036 out of a possible maximum value of 1; which indicates no meaningful association between alcohol status and the use of one or more special diets.

Table 4.99

Significant Interaction Between Alcohol Status and Special Diets Among a National Sample of Adults (N= 34,525)

		Special Diets		Total	
		None	One or more		
Alcohol Status	Lifetime abstainer	Count	7306	145	7451
		% within Alcohol Status	98.1%	1.9%	100.0%
	Former	Count	5233	167	5400
		% within Alcohol Status	96.9%	3.1%	100.0%
	Current infrequent/light	Count	13814	453	14267
		% within Alcohol Status	96.8%	3.2%	100.0%
	Current moderate/heavy	Count	6423	252	6675
		% within Alcohol Status	96.2%	3.8%	100.0%
Total		Count	32776	1017	33793
		% within Alcohol Status	97.0%	3.0%	100.0%

*p <.001 due to large sample size and multiple testing

Note. Some predictors do not add up to total sample due to missing values.

Fourteen percent of participants who were current moderate/heavy drinkers practiced yoga, tai chi, and qi gong compared to 4% of participants who were lifetime abstainers (see Table 4.100). Participants who were lifetime abstainers and former drinkers practiced yoga, tai chi, or qi gong less than participants who were current infrequent/light drinkers and current moderate/heavy drinkers. The Cramér’s statistic is .126 out of a possible maximum value of 1; which indicates a no association between alcohol status and the use of yoga, tai chi, and qi gong.

Table 4.100

Significant Interaction Between Alcohol Status and Yoga, Tai Chi, and Qi gong Among a National Sample of Adults (N= 34,525)

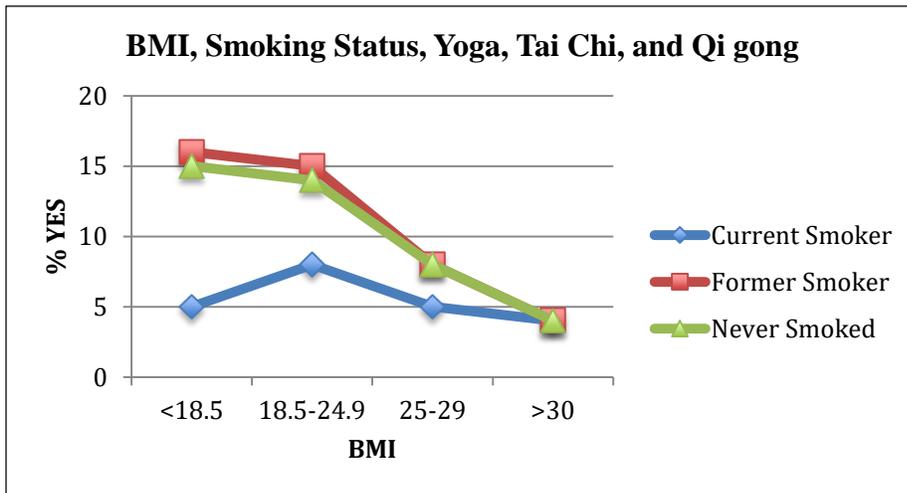
		Yoga, Tai Chi, Qi Gong		Total	
		None	One or More		
Alcohol Status	Lifetime abstainer	Count	7124	327	7451
		% within Alcohol Status	95.6%	4.4%	100.0%
	Former	Count	5111	289	5400
		% within Alcohol Status	94.6%	5.4%	100.0%
	Current infrequent/light	Count	12601	1666	14267
		% within Alcohol Status	88.3%	11.7%	100.0%
	Current moderate/heavy	Count	5777	898	6675
		% within Alcohol Status	86.5%	13.5%	100.0%
Total		Count	30613	3180	33793
		% within Alcohol Status	90.6%	9.4%	100.0%

*p <.001 due to large sample size and multiple testing

Note. Some predictors do not add up to total sample due to missing values.

Four percent (4%) of participants who practiced yoga, tai chi, or qi gong also had a BMI of >30 (obese) and were current smokers, former smokers, or never smoked. Fourteen to fifteen percent (14-15%) of participants who had a BMI classified as healthy (18.5-24.9) and either former smokers or never smoked at all practiced yoga, tai chi, or qi gong compared to 8% of participants who had a BMI classified as healthy and current smokers.

According to Figure 4.2, regardless of BMI, participants who were current smokers reported low usage of yoga, tai chi, and qi gong. Conversely, usage of yoga, tai chi, and qi gong declined as BMI increased in participants who were former smokers or never smoked. The Cramér’s statistic is .051 out of a possible maximum value of 1; which indicates no meaningful association between BMI, smoking status, and the use of yoga, tai chi, and qi gong.



*p <.001 due to large sample size and multiple testing

Figure 4.2 Significant interactions between BMI, smoking status, yoga, tai chi, and qi gong among a national sample of adults (N= 34,525)

RQ 11. Which individual health behaviors, predisposing factors, enabling resources and perceived health status (when combined) influence the use of safe and unsafe CAM modalities?

The log-linear analysis method examined the relationship/associations between predisposing, enabling, and health behavior variables of interest. Cross-tabulation examined the relationship between need variables of interest (perceived health status and evaluated health status). The following Tables include predictive models for the use of safe and potentially unsafe CAM modalities.

As shown in Table 4.101, log-linear analysis found a statistically significant three-way interaction (significance level $<.001$) between BMI, smoking status, yoga, tai chi, or qi gong. Statistically significant two-way interactions were found in 63% of safe modalities.

Analyses did not find statistically significant relationships or associations for all safe predictor variables. Specifically, log-linear analysis found no significant associations between enabling or health behavior variables of interest and use of a practitioner for acupuncture. Additionally, log-linear analysis and cross-tabulation found no significant associations between predisposing or need variables of interest and use of one or more traditional healers. Lastly, there were no significant associations for predisposing, enabling, need, or health behavior variables of interest and use of a practitioner for biofeedback, craniosacral therapy, energy healing, or hypnosis.

Table 4.101

Predictive Model for the Use of Safe CAM Modalities

	Predisposing	Enabling	Need	Health Behaviors
Acupuncture (ACU)	*AGE x ACU (Table 4.19)		*EVALUATED HEALTH x ACU (Table 4.72)	
Biofeedback (BIO)				
Chiropractic or Osteopathic Manipulation (COM)	*AGE x COM (Table 4.18) *MARITAL STATUS x COM (Table 4.22) *RACE x COM (Table 4.32) *SEX x COM (Table 4.38)	*INCOME x COM (Table 4.47) *INSURANCE x COM (Table 4.50) *REGION x COM (Table 4.57)	*PERCEIVED x COM (Table 4.63) *EVALUATED HEALTH x COM (Table 4.70)	*BMI x COM (Table 4.90) *ALCOHOL STATUS x COM (Table 4.94)
Craniosacral Therapy (CST)				
Energy Healing (EH)				
Hypnosis (HY)				
Massage (MAS)	*AGE x MAS (Table 4.13) * EDUCATION x MAS (Table 4.25) * SEX x MAS (Table 4.34)	*INCOME x MAS (Table 4.42)	*PERCEIVED x MAS (Table 4.64) *EVALUATED HEALTH x MAS (Table 4.71)	*SMOKING STATUS x MAS (Table 4.77) *PHYSICAL ACTIVITY x MAS (Table 4.83) *ALCOHOL STATUS x MAS (Table 4.95)
Movement Therapies (MVT)	*AGE x MVT (Table 4.17) *MARITAL STATUS x MVT (Table 4.23) *EDUCATION x MVT (Table 4.28) *RACE x MVT (Table 4.31) *SEX x MVT (Table 4.39)	*INCOME x MVT (Table 4.46)	*PERCEIVED x MVT (Table 4.69) *EVALUATED HEALTH x MVT (Table 4.76)	*SMOKING STATUS x MVT (Table 4.79) *PHYSICAL ACTIVITY x MVT (Table 4.85) *BMI x MVT (Table 4.92)

	Predisposing	Enabling	Need	Health Behaviors
Relaxation Techniques (RXT)	*AGE x RXT (Table 4.15) * EDUCATION x RXT (Table 4.27) *RACE x RXT (Table 4.29) *SEX x RXT (Table 4.37)	*INCOME x RXT (Table 4.48) * DELAY IN CARE x RXT (Table 4.54) * REGION x RXT (Table 4.61)	*PERCEIVED x RXT (Table 4.68)	*PHYSICAL ACTIVITY x RXT (Table 4.88) *BMI x RXT (Table 4.91) *ALCOHOL X RXT (Table 4.97)
Traditional Healers (TH)		*INCOME x TH (Table 4.44) *INSURANCE x TH (Table 4.49) *DELAY IN CARE x TH (Table 4.53) *REGION x TH (Table 4.60)		*ALCOHOL STATUS x TH (Table 4.98)
Yoga, Tai Chi, and Qi gong (YTQ)	*AGE x YTQ (Table 4.16) *MARITAL STAUS x YTQU (Table 4.21) *EDUCATION x YTQ (Table 4.26) *RACE x YTQ (Table 4.30) *SEX x YTQ (Table 4.36)	*DELAY IN CARE x YTQ (Table 4.52) * REGION x YTQ (Table 4.59)	*PERCEIVED x YTQ (Table 4.67) *EVALUATED HEALTH x YTQ (Table 4.75)	*SMOKING STATUS x YTQ (Table 4.78) *PHYSICAL ACTIVITY x YTQ (Table 4.84) *BMI X SMOKING STATUS x YTQ (Figure 4.2) *ALCOHOL STATUS x YTQ (Table 4.100)

*p <.001 due to large sample size and multiple testing

As shown in Table 4.102, log-linear analysis found a statistically significant three-way interaction (significance level $<.001$) between BMI, alcohol status, and multi-vitamin or mineral supplements. Statistically significant two-way interactions were found in 57% of unsafe modalities. However, meaningfully significant associations were found in the use of multi-vitamin or mineral supplements.

Similar to safe modalities, log-linear and cross-tabulation analysis did not find statistically significant relationships or associations for all safe predictor variables of interest. Specifically, log-linear analysis found no significant associations between predisposing and enabling variables of interest and use of herbal or other non-vitamin supplement. Cross-tabulation found no significant associations between need variables of interest and one or more special diets. Log-linear analysis and cross-tabulation found no significant associations between enabling, need, and health behavior variables of interest and use of a practitioner for homeopathy. Lastly, there were no significant associations for predisposing, enabling, need, or health behavior variables of interest and use of a practitioner for ayurveda, chelation therapy, or naturopathy.

Table 4.102

Predictive Model for the Use of Unsafe CAM Modalities

	Predisposing	Enabling	Need	Health Behaviors
Ayurveda (AYU)				
Chelation Therapy (CHE)				
Herbal and Non-Vitamin Supplements (HNS)			*PERCEIVED x HNS (Table 4.66) *EVALUATED HEALTH x HNS (Table 4.74)	*SMOKING STATUS x HNS (Table 4.80) *PHYSICAL ACTIVITY x HNS (Table 4.86)
Homeopathy (HOM)	*SEX x HOM (Table 4.40)			
Naturopathy (NAT)				
Special Diets (SD)	*RACE x SD (Table 4.33) *SEX x SD (Table 4.41)	*INCOME x SD (Table 4.45) * DELAY IN CARE x SD (Table 4.56) * REGION x SD (Table 4.62)		*SMOKING STATUS x SD (Table 4.82) *PHYSICAL ACTIVITY x SD (Table 4.89) *ALCOHOL STATUS x SD (Table 4.99)
Multi-vitamin and mineral supplements (MVS)	*MARITAL STATUS x AGE x MVS (Figure 4.1) * AGE x MVS (Table 4.14) * MARITAL STATUS x MVS (Table 4.20) * EDUCATION x MVS (Table 4.24) *SEX x MVS (Table 4.35)	*INCOME x MVS (Table 4.43) *INSURANCE x MVS (Table 4.51) * DELAY IN CARE x MVS (Table 4.55) * REGION x MVS (Table 4.58)	*PERCEIVED x MVS (Table 4.65) *EVALUATED HEALTH x MVS (Table 4.73)	*SMOKING STATUS x MVS (Table 4.81) *PHYSICAL ACTIVITY x MVS (Table 4.87) *BMI X MVS (Table 4.93) *ALCOHOL STATUS x MVS (Table 4.96)

*p <.001 due to large sample size and multiple testing

Although statistically significant associations were found in a multitude of interactions, statistically significant data only displays a magnitude of the difference (Field, 2013). Therefore, Cramér's V was used to test the association between the categorical variables of interest.

As shown in Table 4.104, meaningfully significant associations were found in safe unsafe, and neutral CAM modalities, including, the use of a practitioner for acupuncture, massage, and chiropractic or osteopathic manipulation. Additionally, meaningfully significant associations were found in the use of multi-vitamin and mineral supplements, the use of one or more relaxation techniques, and yoga, tai chi, and qi gong.

Table 4.103

Predictive Model for Meaningfully Significant Safe and Unsafe CAM Modalities

	Predisposing	Enabling	Need	Health Behaviors
Acupuncture (ACU)	*AGE x ACU (Cramér's V=.118)			
Chiropractic or Osteopathic Manipulation (COM)	*AGE x COM (Cramér's V=.103)			
Massage (MAS)	*AGE x MAS (Cramér's V=.115)	*INCOME x MAS (Cramér's V=.133)	*PERCEIVED x MAS (Cramér's V=.115)	*ALCOHOL STATUS x MAS (Cramér's V=.105)
Relaxation Techniques (RXT)	*EDUCATION x RXT (Cramér's V=.105)			*PHYSICAL ACTIVITY x RXT (Cramér's V=.100)
Yoga, Tai Chi, and Qi gong (YTQ)	*AGE x YTQ (Cramér's V=.123) *EDUCATION x YTQ (Cramér's V=.159) *SEX x YTQ (Cramér's V=.113)			*PHYSICAL ACTIVITY x YTQ (Cramér's V=.162) *ALCOHOL STATUS x YTQ (Cramér's V=.126)
Multi-vitamin and mineral supplements (MVS)	*MARITAL STATUS x AGE x MVS (Cramér's V=.283)			

Note. A statistically significant measure with a small effect size or higher indicates a meaningful difference.

CHAPTER 5

DISCUSSION

CAM exists on a continuum of provider-directed to self-directed modalities with a history of use and origins outside of conventional Western medicine (Clarke et al., 2015). People use modalities to relieve symptoms or side effects associated with chronic illness, to improve health and overall well-being, or to treat health conditions. However, unlike conventional medicine, some CAM has not undergone sufficient scientific study. Therefore, accurate scientific information is not available for many of these modalities. Some are safe and effective, some are unsafe and effective, some are neutral, and others are unsafe and ineffective (Whitney & Rolfes, 2016). Furthermore, in general, patients are hesitant to tell traditional health care providers what CAM they are using. Nondisclosure can be attributed to doctors' lack of knowledge about CAM, beliefs that the doctor will not understand, or fear of doctors' negative response to patients' use of CAM (Chao et al., 2008). Additionally, nondisclosure varies by race or ethnicity, and type of CAM (Chao et al., 2008).

Many studies have examined factors that enable and encourage the use of CAM practices, products, and services among a national sample of adults. However, studies that examine factors related to prevalence, patterns, and disclosure of CAM use in the context of safe and potentially unsafe modalities have been limited.

The purpose of the present study was to categorize CAM as safe and effective, unsafe and effective, neutral, and unsafe and ineffective; to examine the use of safe and unsafe CAM therapies among a national sample of adults; to identify the top three self-reported CAM modalities; to identify factors associated with patient disclosure for the top three self-reported CAM modalities; to ascertain the reasons for the use of the top three self-reported CAM; and to determine which predisposing, enabling, need, and health behavior practices were related to CAM use among a national sample of adults. This chapter presents a summary of the sample population, the results of each research question, discussion, limitations and strengths of the study, implications, effectiveness of the theoretical framework, and recommendations for future research.

Summary of the Sample Population

The adult response for the 2012 NHIS sample was 34,525. More than half of the population identified as White (75%), 17% identified as Hispanic, and 15% identified as AA. Fifty-six percent were females, 19% were 18 to 29 years of age, less than half (43%) were married, and over half (67%) reported at least one adult in the family received more than a high school education. Thirty-six percent of the sample lived in the South, 44% reported the total combined family income was \leq \$34,999, 91% reported a family member had insurance, and 17% delayed medical care because of cost.

Fewer than one-third (26%) reported excellent health and 23% of participants were diagnosed with one to three chronic health conditions by a health care provider. Less than half of the sample (42%) were current infrequent/light drinkers, 59% reported they never smoked, over half of the population (64%) had a BMI classified as overweight or obese, and 56% engaged in more than once a week of light/moderate physical activity per week.

Research Questions/Discussion

RQ1. Which types of CAM modalities are considered safe and effective, unsafe and effective, neutral, and unsafe and ineffective?

This research question required categorization of the NHIS 2012 CAM into Whitney & Rolfes (2016) risk/benefit relationship chart. CAM modalities that were considered safe and effective included biofeedback, chiropractic or osteopathic manipulation, hypnosis, massage, movement therapies, relaxation techniques, and yoga, tai chi, and qi gong. Neutral modalities included acupuncture, craniosacral therapy, energy healing, and traditional healers. CAM modalities that were considered potentially unsafe and ineffective modalities included special diets and vitamin and mineral supplements; and unsafe and ineffective modalities included ayurveda, chelation therapy, herbal and non-vitamin supplements, homeopathy, and naturopathy.

RQ 2. What types of CAM modalities (safe and unsafe) are African-Americans, Hispanics, and Whites using?

This research question examined the use of safe and potentially unsafe CAM among a national sample of adults. Based on the results, 26% of White participants, 12% of Hispanic participants, and 10% of AA participants used or saw a practitioner for one or more safe CAM modalities. Conversely, 49% of White participants and 29% of AA and Hispanic participants used or saw a practitioner for one or more unsafe CAM modalities. These findings suggests that participants who identified as White, AA, and Hispanic used or saw a practitioner for unsafe CAM modalities more than safe CAM modalities. To the researcher's knowledge, this study is the first to categorize the 2012 NHIS CAM modalities into safe and potentially unsafe modalities. Therefore, research on factors related to prevalence, patterns, and costs associated with the use of safe and unsafe modalities among racial groups has been unknown.

RQ 3. What are the top three self-reported CAM modalities used by African-Americans, Hispanics, and Whites?

This research question examined the top three self-reported CAM modalities used by AAs, Hispanics, and Whites. Based on data collected from sample adults on the use of eighteen CAM, the top three self-reported CAM modalities were multi-vitamin or mineral supplements, non-vitamin herbal supplements, and yoga, tai chi, and qi gong. These findings are consistent with recent research conducted on trends in the use of CAM in the United States. Based on analysis from the 2002, 2007, and 2012 NHIS Clarke et al. (2015) reported the use of dietary supplements in the U.S. remained the most popular (Clarke et al., 2015). Furthermore, Clarke et al. (2015) found the use of yoga, tai chi, and qi gong also increased across the three time points (Clarke et al., 2015).

Excluding multi-vitamin or mineral supplements, non-vitamin herbal supplements, and yoga, tai chi, and qi gong, the top three self-reported CAM modalities were chiropractic or osteopathic manipulation, massage, and special diets. Regarding the first self-reported most used CAM, over two-thirds (88%) identified as White, 10% identified as Hispanic, and 5% identified as AA. The second self-reported most used CAM was massage. According to the results, 85% identified as White, 11% identified as Hispanic, and 7% identified as AA. Regarding the third self-reported most used CAM, 79% identified as White, 11% identified as Hispanic, and 9% identified as AA.

The growth of provider-directed CAM therapies such as acupuncture, chiropractic or osteopathic manipulation, and massage has been documented in research. In a study conducted on CAM trends from the 2002 and 2007 NHIS, Su and Li (2011) found an increase in provider-directed therapies (Su & Li, 2011). Additionally, consistent with the present study, Su and Li

(2011) also indicate that Whites used provider-directed therapies more than racial and ethnic minorities (Su & Li, 2011). The need for same-race health care providers among racial and ethnic groups is a potential explanation for the lower use of provider-directed therapies, which may explain why White participants use provider-directed therapies more than racial or ethnic minorities (Whedon, Kimura, & Philips, 2015). Researchers have also examined the increase in the number of states that offer licensed provider-directed therapies and the corresponding increase in licensed practitioners in the U.S. (Barnes, Bloom, & Nahin, 2008; Su & Li, 2011). Another factor is the increased awareness of these types of therapies from media outlets that express the benefits of provider-directed therapies to the public (Su & Li, 2011). Additionally, financial barriers, such as unmet medical needs or delayed care due to costs, are also potential explanations for the increase in the use of provider-directed therapies (Su & Li, 2011).

The use of diets that focus on the restriction of specific food groups have remained popular over the past decade (Foxcroft, 2011; Leung et al., 2018). In a study on trends in the use of special diets, Leung et al. (2018) state the use of special diets among a national sample of adults from the 2002 to 2012 NHIS remained stable (Leung et al., 2018). Findings from the present study are consistent with previous findings that suggest predictors for the use of special diets include race or ethnicity, education, and income (Leung et al., 2018; Rehm, Penalvo, & Afshin, 2016). Consistent with findings from Su and Li (2011), Leung et al. (2018) found that Whites were more likely to use special diets than AAs (Leung et al., 2018). A potential explanation for racial differences in the use of special diets may stem from residential segregation (Bahr, 2007). Specifically, low socioeconomic neighborhoods disproportionately experience food deserts; which may require residents to rely on small convenience stores with limited nutritional alternatives (Bahr, 2007). Furthermore, urban environments tend to

experience limited transportation options, which place suburban supermarkets out of reach (Bahr, 2007).

RQ 4. What factors are associated with patient disclosure to a physician regarding CAM modalities?

This research question examined factors that were associated with patient disclosure of the top three modalities among a national sample of adults. Regarding disclosure of the first most used CAM, 67% of AA, 61% of White, and 60% of Hispanic participants disclosed the use of chiropractic or osteopathic manipulation to a health care provider. Additionally, females who were aged 60 to 69, reported at least one family member received less than a high school education, were never married, reported the total combined yearly income was \leq \$34,999, lived in the Northeast, and reported a family member had insurance disclosed the use of the chiropractic or osteopathic manipulation to a health care provider.

Sixty-eight percent of AA, and 57% of Hispanic, and 47% of White participants disclosed the use of massage to a health care provider. Moreover, males who were aged 50 to 69, reported at least one family member received more than a high school education, were separated, reported the total combined yearly income was \leq \$34,999 or \$75,000 to \$99,999, lived in the South, and reported a family member had insurance disclosed the use of massage to a health care provider. Regarding the third most used CAM, 40% of Hispanic, 29% of White, and 23% of AA, did not disclose the use of special diets to a health care provider. Furthermore, males who were aged 40 to 49, received more than a high school education, were cohabitating, reported the total combined yearly income was \leq \$74,999, lived in the Northeast, and reported a family member had insurance did not disclose the use of special diets to a health care provider.

In previous studies, 35% of U.S. adults reported use of some form of CAM, however, 42% of CAM users do not disclose the use of CAM to a healthcare provider (Jou & Johnson, 2016). Findings from the present study suggest nondisclosure for chiropractic or osteopathic manipulation and massage were higher among Hispanic and White participants compared to AA participants. Conversely, nondisclosure for special diets was highest among Hispanic participants compared to AA and White participants. This finding is consistent with previous research, which suggests disclosure differs based on the type of CAM used and differences in racial groups (Chao et al., 2008). Nondisclosure among minorities can be attributed to barriers such as lack of adequate health care, finances, insurance, suboptimal sources of care, and cultural factors (Chao et al., 2008; Noonan et al., 2016).

Additionally, perceived discrimination may also play a role in low disclosure rates among racial groups (Whedon et al., 2015). Although disclosure rates were consistent with previous research, a limitation to the present study is the lack of culturally sensitive therapies in the 2012 NHIS (e.g., folk remedies) that are familiar to AA and Hispanic communities. Therefore, the disclosure of commonly used therapies among racial groups is not fully known.

Other factors that influence disclosure rates include the belief that the doctor lacks knowledge on certain CAM, the concern that the doctor will provide a negative response to the use of CAM and the perception that doctors view some CAM as more legitimate than others also contribute to nondisclosure (Chao et al., 2008). In a commentary by Jou and Johnson (2016) on disclosure of the 2012 NHIS CAM modalities, findings suggest nondisclosure is attributed to concerns about the physicians' knowledge on CAM rather than physicians' discouragement or negativity about the use of CAM (Jou & Johnson, 2016). Therefore, incorporating education on the use of CAM in schools of nursing, medicine, pharmacy, and allied health professions may

improve patient communication and increase knowledge regarding integrative health approaches among adults.

RQ 5. What are reported reasons (wellness, treatment, or wellness and treatment) for using the top three CAM modalities among African Americans, Hispanics, and Whites?

This research question examined the reason for using the top three self-reported CAM modalities. Reported reasons were categorized into wellness only, treatment only, or wellness and treatment combined. Regarding reported reasons for the first most used CAM, (chiropractic or osteopathic manipulation), almost half of the population (49% of Hispanic participants and 47% of White and AA participants) used chiropractic or osteopathic manipulation for wellness only. Forty percent of AA participants, 39% Hispanic participants, and 38% of White participants used the first most used CAM for treatment only; and 15% of White participants, 13% of AA participants, and 12% used the modality for both wellness and treatment combined.

Nearly one-third of AA and White participants used massage for wellness only while 19% of Hispanic participants used massage for wellness only. Forty-five percent of AA participants, 36% of White participants, and 33% of Hispanic participants used massage for treatment only, and 49% of Hispanic participants, 33% of White participants, 23% of AA participants used the modality for both wellness and treatment combined.

In the current study, regarding reported reasons for the third most used CAM, (special diets), over half of participants (62%) who identified as White and less than half of participants who identified as Hispanic and AA (40% and 25% respectively) used special diets for wellness only. Fifty percent of AA participants, 20% of Hispanic participants, and 16% of White participants used the third most used CAM for treatment only; and less than half of the

population (40% of Hispanic, 25% of AA, and 22% of White participants) used special diets for both wellness and treatment combined.

Previous research suggests people use provider-directed therapies such as chiropractic or osteopathic manipulation, massage, and acupuncture to restore health, correct alignment, and alleviate pain (Edzard, 2008; National Center for Complementary and Integrative Health, 2017; Whitney & Rolfes, 2016). Consistent with these findings, results from the present study suggest White, AA, and Hispanic participants used chiropractic or osteopathic manipulation for wellness only more than treatment or wellness and treatment combined.

Regarding the use of massage, the present study suggests White and AA participants used the modality for treatment more than wellness only or wellness and treatment combined, and Hispanic participants reported using massage for wellness and treatment combined more than wellness only or treatment only. Although research is preliminary, and in some cases conflicting, research suggests massage can be effective in reducing adverse side effects associated with chronic health conditions such as pain, fatigue, nausea, or anxiety (The National Center for Complementary and Integrative Health 2017). The present study did not examine the relationship between massage for treatment of a specific health condition, and it is unknown if participants used massage for general wellness or general disease prevention, to improve energy, or improve immune function. Additionally, the discrepancy between reported reasons for the use of massage among racial groups deserves attention. To the researcher's knowledge, limited research is available on the use of massage among racial or ethnic minorities. Therefore, future research should be needed to ascertain the specific health condition and wellness purpose for the use of massage among adults.

Research suggests people use self-directed therapies such as special diets for weight loss, to decrease the presence of modifiable risk factors, or for cultural or religious reasons (Leung et al., 2018). Based on results from the present study, White participants used special diets for wellness only compared to treatment only or wellness and treatment combined, AA participants used special diets for treatment only compared to wellness only or wellness and treatment combined, and Hispanic participants used special diets for wellness and treatment combined. Leung et al. (2018) conducted an analysis on the 2012 NHIS to ascertain specific reasons for using special diets. According to their results, 77% of participants used special diets to improve overall health, 70% used the modality for general wellness or general disease prevention, and 53% used the modality to improve energy (Leung et al., 2012). Additionally, almost a third of participants used special diets for treatment of a specific health condition (Leung et al., 2018). Further research is needed to examine why disparities exist between reported reasons and special diets because research suggests willingness to disclose is linked to the type of CAM; specifically the use of self-directed modalities (Chao et al., 2008).

RQ 6. Which predisposing factors (e.g., age, marital status, education, race/ethnicity, and sex) influence use of CAM modalities?

This research question examined which predisposing factors influence the use of CAM modalities. Statistically significant associations were found in the use of a practitioner for acupuncture, chiropractic or osteopathic manipulation, massage, and homeopathy. Specifically, findings from the present study suggest males saw a practitioner for homeopathy more than females, and as participants aged, the use of a practitioner for chiropractic or osteopathic manipulation, massage, and acupuncture decreased. Statistically significant differences were also

found in the use of multi-vitamin or mineral supplements, relaxation techniques, special diets, movement therapies, and yoga, tai chi, and qi gong.

According to the results of the present study, the use of multi-vitamin or mineral supplements increased as age, and educational attainment increased, females used multi-vitamin or mineral supplements more than males, and participants who were separated or never married used multi-vitamin or mineral supplements less than participants who were married, divorced, widowed, or cohabitating. Similar to findings for provider-directed modalities (e.g., chiropractic or osteopathic manipulation, massage, and acupuncture) the use of one or more relaxation techniques decreased as participants aged. However, as educational attainment increased, so did the use of one or more relaxation techniques.

Race and sex were also predictors for the use of relaxation techniques and special diets. Findings from the present study suggest 5% of White participants and 3% of AA participants used one or more relaxation techniques compared to 3% of White participants and 2% of AA participants who used one or more special diets. Findings also suggest females used one or more special diets and relaxation techniques more than males.

Statistically significant predictors were also found in race, age, marital status, education, and sex for the use of movement therapies and yoga, tai chi, and qi gong. According to the results, one percent of White and less than one percent of AA participants used one or more movement therapies compared to 10% of White and 5% of AA participants who practiced yoga, tai chi, and qi gong. Consistent with previous study findings, as participants aged, the use of one or more movement therapies and yoga, tai chi, and qi gong decreased; and the use of one or more movement therapies and yoga, tai chi, and qi gong increased as educational attainment increased. Additionally, participants who were divorced, widowed, or separated used one or more

movement therapies less than participants who were married, never married, or cohabitating, and females used one or more movement therapies, yoga, tai chi, and qi gong more than males.

Lastly, participants who were 70 years of age or older and separated used multi-vitamin or mineral supplements more than participants who were divorced or widowed in the same age group. Additionally, participants who were 18 to 29 years old and never married used multi-vitamin or mineral supplements more than participants who were cohabitating in the same age group.

RQ 7. Which enabling resources (e.g., household income, current health insurance status, delay in medical care, and US Census Bureau geographic region) influence use of CAM modalities?

This research question examined which enabling resources influence the use of CAM modalities. Statistically significant associations were found in the use of a practitioner for chiropractic or osteopathic manipulation, and massage. Specifically, 36% of participants who reported a family member had health insurance saw a practitioner for chiropractic or osteopathic manipulation and participants who lived in the Northeast, South, and West saw a practitioner for chiropractic or osteopathic manipulation less than participants who lived in the Midwest. Additionally, as income increased, so did the use of a practitioner for chiropractic or osteopathic manipulation and massage. Statistically significant differences were also found in the use of multi-vitamin or mineral supplements, relaxation techniques, special diets, movement therapies, traditional healers, yoga, tai chi, and qi gong.

Income, insurance, delay in medical care, and region were statistically significant predictors for the use of multi-vitamin or mineral supplements and traditional healers. Findings from the present study suggest as income increased, so did the use of multi-vitamin or mineral supplements. Conversely, as income increased, the use of one or more traditional healers

decreased. Seventy-eight percent of participants who used multi-vitamin or mineral supplements reported a family member had health insurance compared to 1% of participants who used one or more traditional healers and reported a family member had insurance. Seventy-five percent of participants who used multi-vitamin or mineral supplements reported a family member delayed medical care because of cost compared to 3% of participants who used traditional healers reported a family member delayed medical care because of cost. Lastly, participants who lived in the Midwest used multi-vitamin or mineral supplements less than participants who lived in the Northeast, South, and West; and participants who lived in the West used one or more traditional healers more than participants who lived in the Northeast, Midwest, and South.

Statistically significant predictors were also found in income, delay in medical care, and region for the use of relaxation techniques and special diets. Consistent with previous research, as income increased, so did the use of one or more relaxation techniques and special diets. Eight percent of participants who practiced one or more relaxation techniques reported a family member delayed medical care because of cost compared to 5% of participants who used one or more special diets who reported a family member delayed medical care because of cost; and participants who lived in the South used one or more relaxation techniques and/or special diets less than participants who lived in the Northeast, Midwest, and West.

Income was the only statistically significant predictor for the use of one or more movement therapies. Based on results from the present study, as income increased, so did the use of one or more movement therapies. Delay in medical care and region were statistically significant predictors for the use of yoga, tai chi, and qi gong. Findings from the present study indicate 11% of participants who practiced yoga, tai chi, or qi gong reported a family member

delayed medical care because of cost, and participants who lived in the Midwest and South used yoga, tai chi, or qi gong less than participants who lived in the Northeast and West.

RQ 8. How does perceived health status influence use of CAM?

This research question examined the relationship between perceived health status (reported health status) and CAM modalities. Statistically significant associations were found in the use of a practitioner for chiropractic or osteopathic manipulation and massage. Additionally, statistically significant differences were found in the use of multi-vitamin or mineral supplements, herbal non-vitamin supplements, movement therapies, relaxation techniques, and yoga, tai chi, and qi gong. In the present study, the use of a practitioner for massage, chiropractic osteopathic manipulation decreased as reported health status declined. Additionally, participants who reported excellent or very good health used relaxation techniques, multi-vitamin or mineral supplements, and herbal non-vitamin supplements more than participants who reported good, fair, or poor health. However, participants who practiced yoga, tai chi, and qi gong increased as reported health status decreased.

RQ 9. How does health status evaluated by a health care provider influence use of CAM modalities?

This research question examined the relationship between evaluated health status (diagnosed by a health care provider) and CAM modalities. Statistically significant associations were found in the use of a practitioner for acupuncture, chiropractic or osteopathic manipulation, and massage. Specifically, 22% of participants who saw a practitioner for acupuncture, 30% of participants who saw a practitioner for chiropractic or osteopathic manipulation, and 46% of participants who saw a practitioner for massage were diagnosed with one to three chronic health conditions by a health care provider.

Additionally, 76% of participants who used herbal or other non-vitamin supplements, 78% of participants who used multi-vitamin or multi-minerals, less than one percent of participants who used one or more movement therapies, and five percent of participants who practiced yoga tai chi, or qi gong were diagnosed with one to three chronic health conditions by a health care provider.

RQ 10. Which individual health behaviors (e.g., smoking status, physical activity, BMI, and Alcohol status) influence use of CAM?

This research question examined which health behavior practices influence CAM modalities. Statistically significant associations were found in the use of a practitioner for chiropractic or osteopathic manipulation, massage, the use of herbal and non-vitamin supplements, multi-vitamin or mineral supplements, movement therapies, relaxation techniques, traditional healers, special diets, and yoga, tai chi, and qi gong.

BMI and alcohol status were statistically significant predictors for the use of a practitioner for chiropractic or osteopathic manipulation. According to the results, the use of a practitioner for chiropractic or osteopathic manipulation increased as BMI decreased, except for participants who had a BMI classified as underweight (<18.5). Furthermore, participants who were former drinkers saw a practitioner for chiropractic or osteopathic manipulation less than participants who were lifetime abstainers and current drinkers.

Statistically significant differences were also found in smoking status, physical activity, and alcohol status for the use of a practitioner for massage. According to the results, participants who were current smokers used a practitioner for massage less than participants who were former smokers or never smoked. Fifty-four percent of participants who saw a practitioner for massage also engaged in more than once a week of leisure/moderate physical activity and

participants who were former drinkers saw a practitioner for massage less than participants who were lifetime abstainers and current drinkers.

Smoking status and physical activity were statistically significant predictors for the use of herbal and non-vitamin supplements. Based on results from the present study, participants who were current smokers used herbal or other non-vitamin supplements less than participants who were former smokers or never smoked; and participants who engaged in less than once a week of physical activity used herbal or other non-vitamin supplements less than participants who engaged in more than once a week of physical activity and participants who engaged in no physical activity.

Statistically significant differences were also found in smoking status, physical activity, BMI, and alcohol status for the use of multi-vitamin or mineral supplements. Findings from the present study suggest participants who were current smokers used multi-vitamin or mineral supplements less than participants who were former smokers or never smoked, and 79% of participants who engaged in more than once a week of physical activity also used multi-vitamin or mineral supplements. Similar to previous findings from the present study, the use of multi-vitamin or mineral supplements increased as BMI decreased except for participants who had a BMI classified as <18.5; and participants who were current moderate/heavy drinkers used multi-vitamins or mineral supplements less than participants who were current infrequent/light drinkers, former drinkers, or lifetime abstainers.

Smoking status, physical activity, and BMI were statistically significant predictors for the use of movement therapies. Based on findings from the present study, participants who were current smokers used one or more movement therapies less than participants who were former smokers or participants who never smoked. Additionally, participants who engaged in more than

once a week of physical activity used one or more movement therapies more than participants who engaged in less than once a week of physical activity or participants who engaged in no physical activity, and the use of one more movement therapies decreased as BMI increased.

Statistically significant differences were found in physical activity, BMI, and alcohol status for the use of relaxation techniques. According to the results, participants who engaged in no physical activity used one or more relaxation techniques less than participants who engaged in physical activity, and the use of one or more relaxation techniques increased as BMI decreased, except for participants who had a BMI classified as unhealthy (<18.5).

Alcohol status was also a predictor for the use of relaxation techniques and traditional healers. According to the results, participants who were lifetime abstainers used one or more traditional healers or one or more relaxation techniques less than participants who were former drinkers, current infrequent/light drinkers, or current moderate/heavy drinkers.

Smoking status, physical activity, and alcohol status were statistically significant predictors for the use of special diets and yoga, tai chi, and qi gong. Findings from the present study suggest participants who were current smokers used special diets less than participants who were former smokers or never smoked. Additionally, participants who engaged in no physical activity used one or more special diets less than participants who engaged in physical activity; and participants who were former drinkers and current drinkers used one or more special diets less than lifetime abstainers.

Statistically significant differences were also found in smoking status, physical activity, and alcohol status for the use of yoga, tai chi, and qi gong. According to the results, participants who were current smokers practiced yoga, tai chi, or qi gong less than participants who were former smokers or participants who never smoked. Additionally, participants who engaged in no

physical activity practiced yoga, tai chi, or qi gong less than participants who engaged in physical activity. Participants who were lifetime abstainers and former drinkers practiced yoga, tai chi, or qi gong less than participants who were current drinkers. Lastly, study findings suggest regardless of BMI, participants who were current smokers reported low usage of yoga, tai chi, and qi gong. Conversely, usage of yoga, tai chi, and qi gong declined as BMI increased in participants who were former smokers or never smoked.

RQ 11. Which individual health behaviors, predisposing factors, enabling resources and perceived health status (when combined) influence the use of safe and unsafe CAM modalities?

Log-linear analysis was utilized to examine the relationships/associations between predisposing, enabling, and health behavior variables of interest. Cross-tabulation examined the relationship between need variables of interest (perceived health status and evaluated health status). Log-linear analysis found statistically significant three-way interactions (significance level $<.001$) between BMI, smoking status, yoga, tai chi, and qi gong and BMI, alcohol status, and multi-vitamin or mineral supplements. Statistically significant two-way interactions were found in 63% of safe modalities and 57% of unsafe modalities.

Although interactions included in data analysis were statistically significant, many of these associations did not indicate the degree of usefulness for the variables of interest. To rectify this, Cramér's V was used to test the association between the categorical variables of interest. After examining Cramér's V on all statistically significant associations, a small to medium association was found in the use of multi-vitamin and mineral supplements. Additionally, small associations were found in the use of a practitioner for acupuncture, chiropractic or osteopathic manipulation, and massage and the use of one or more relaxation techniques, yoga, tai chi, and qi gong.

The results from the present study suggest as participants aged, the use of a practitioner for acupuncture, massage, chiropractic or osteopathic manipulation, and the use of yoga, tai chi, and qi gong decreased. This finding is inconsistent with previous analysis on NHIS data (Institute of Medicine, 2005). To the researcher's knowledge, this study is the first to examine the use of a practitioner for provider-directed therapies. Therefore, although research indicates the use of CAM increases as participant's age, this study suggests the use of a practitioner for commonly used modalities decreases as participant's age. Consistent with previous research, females practiced yoga, tai chi, and qi gong more than males, and the use of relaxation techniques, yoga, tai chi, and qi gong were higher among participants who had more than a high school education. This finding is consistent with previous research that states being more educated, earning greater income, and being female are predictors for the use of CAM (Barner et al., 2010; Grzywacz et al., 2005; Institute of Medicine, 2005).

A significant difference was only found in one potentially unsafe modality (i.e., multi-vitamin or mineral supplements). Specifically, marital status and age (when combined) were significant predictors for the use of multi-vitamin or mineral supplements. Based on results from the present study, participants who were 70 years of age or older and separated used multi-vitamin or mineral supplements more than participants who were divorced or widowed in the same age group. Additionally, participants who were 18 to 29 years of age and cohabitating used multi-vitamin or mineral supplements more than participants who were never married in the same age group. Although the use of multi-vitamin and mineral supplement use among older adults has been documented (Thomas, 2006), to the researcher's knowledge there are limited studies on the relationship between marital status and age (when combined) and CAM use. Further studies are needed to examine this association.

Based on results from the present study, the use of a practitioner for massage decreased as self-reported health status declined, and participants who were lifetime abstainers or former drinkers used a practitioner massage and practiced yoga, tai chi, and qi gong less than participants who were current drinkers. Additionally, consistent with findings from previous research, the present study also suggests participants who engaged in no physical activity used relaxation techniques and yoga, tai chi, and qi gong less than participants who engaged in physical activity.

Although race and ethnicity were not meaningfully significant predictors for the use of CAM in the present study, analysis by cross-tabulation suggests a meaningfully significant association for health behavior predictors, including, BMI, alcohol status, and smoking status. Specifically, 72% of AA participants, 69% of Hispanic participants, and 64% of White participants had a BMI classified as overweight or obese. This finding is consistent with the current literature on adult obesity in the U.S., which reports rates of overweight and obese individuals have increased, especially among minority groups (CDC, 2018; McKernan, Ratcliffe, Steuerle, & Zhang, 2014; Wang & Beydoun, 2007). Research suggests individuals who are overweight and obese are more prone to replacing standard weight-lowering methods for forms of potentially unsafe CAM (Esteghamati, Mazaheri, Rad, & Noshad, 2015).

Additionally, consistent with findings from the NSDUH, alcohol use was highest among Whites (65%). However, contrary to the NSDUH, alcohol use among Hispanics was higher than AAs (55% and 53% respectively). In a study conducted by Rosen et al. (2013), researchers found that those who were former drinkers or social drinkers were 1.314 times more likely to use forms of CAM compared to those who were regular consumers of alcohol (Rosen et al., 2013).

Experts also recommend abstaining from smoking (CDC, 2016). According to the CDC (2017), Hispanics have a lower prevalence of cigarette smoking and other tobacco use than any other racial or ethnic group (CDC, 2017). Consistent with other research findings, the present study found statistical differences in smoking status. Specifically, 13% of Hispanics were current smokers compared to 19% of White participants and 20% of AA participants. There has been emerging interest in the use of CAM such as hypnosis, yoga, or mindfulness meditation to aid in smoking cessation (National Center for Complementary and Integrative Health, 2017). Although several interventions have shown promise, there is not enough evidence to suggest use of CAM as an effective smoking cessation treatment (National Center for Complementary and Integrative Health, 2017).

Limitations

There were several limitations of the current study, including cross-sectional nature of the study, the collection of self-report information, survey bias, nonresponse and poststratification weights, the omission of culturally sensitive modalities common among African American and Hispanic groups, and large sample size.

This study used data from the 2012 NHIS, which may not reflect the current extent or usage of CAM in the United States. Furthermore, the NHIS is cross-sectional survey. Strengths to this type of study design are they are relatively inexpensive, and the researcher can compare different populations at a defined time (Barratt & Kirwan, 2009). Moreover, cross-sectional studies contain multiple variables at the time of data collection and many findings can be analyzed to create new theories/studies or in-depth research (Barratt & Kirwan, 2009). However, cross-sectional studies do not describe cause and effect relationships; therefore causal

associations cannot be made. Additionally, participants may have difficulty recalling past events, which may cause bias results.

In the present study, the collection of self-report information prevented the collection of objective data on the use of CAM. Participants were asked to recall the use of CAM in the past 12 months, which can create recall bias for some modalities. Additionally, the use of socially acceptable responses is also a limitation. Social desirability bias occurs when the participant responds to questions (or reports a behavior) in a manner that is favorable to the interviewee (Thomson & Phua, 2005). This is a concern especially when conducting research with self-report data as it may interfere with the interpretation of average tendencies as well as individual differences (Thomson & Phua, 2005). Sensitive topics that can lead to social desirability bias include personal income and earnings, reported health status, religion, weight, and health behavior practices such as alcohol and smoking status (Krumpal, 2013).

Nonresponse or poststratification weights is another study bias that pertains to persons with certain characteristics that are not likely to respond in the study. Examples include age, education, race/ethnicity, gender, and place of residence (Johnson, 2008). The wording (or phrasing) of questions is a related limitation because participants may have misunderstood the terminology or phrase presented by the interviewer. Question bias can damage the validity of a measure (Furnham, 1986). For the present study, interviewers asked participants about their use of spiritual meditation (including centered prayer and contemplative meditation). Findings suggest the use of spiritual meditation was low among African Americans and Hispanics. This may be attributed to the phrasing of the question, as it may not have captured what racial and ethnic minorities considered prayer. Prayer as an individual modality was included in the 2002 and 2007 NHIS. However, for the 2012 NHIS, the modality was incorporated into spiritual

meditation. Many researchers recognize the relationship between prayer and health, especially among racial and ethnic groups (Barner et al., 2010; Jones et al., 2008; Dessio et al., 2004). Therefore, prayer, as a standalone modality, is needed, especially among racial and ethnic groups.

Another limitation of the present study was the lack of important culturally sensitive modalities, such as home remedies or folk remedies, were not used in the NHIS. Many racial and ethnic minorities use scientific medicine in conjunction with folk (or herbal) medical systems because traditionally, medical care was excluded (Boyd, Taylor, Shimp, & Semler, 2000). Patient's folk remedy beliefs and practices may influence their relationship with health care providers. Therefore, the addition of home or folk remedies in the list of CAM, along with continued research on factors associated with the use of home or folk remedies is needed.

Lastly, the NHIS consists of a large sample size, which skewed significant p values. Therefore, for the present study, Pearson's chi-square test for two-way and three-way interactions were limited to $<.001$ instead of $<.05$. However, a strength of a large sample size is it provides more data as well as enables oversampling of underrepresented racial and age groups, which is a strength of this study.

Strengths of the Study

Although there were several limitations of the study, several strengths exist, including the categorization of CAM modalities into safe and unsafe, the use of a nationally representative sample of adults, solid sampling techniques, and an extensively used theoretical framework.

The National Center for Complementary and Integrative Health (NCCIH) (2016) advises CAM users against the use of any product, service or practice that has not been scientifically proven safe and effective as a substitute for conventional treatment. Because some CAM

modalities, unlike conventional medicine, have not undergone sufficient scientific study, accurate scientific information is not available for many of these modalities. Some are safe and effective, some are safe and ineffective, and some are harmful, some are neutral, and potentially dangerous (Sizer & Whitney, 2017). Therefore, categorizing the use of these modalities in this way is important, because people may be putting themselves at risk by direct use of a modality or by replacing a modality with known traditional safe and effective conventional care (National Center for Complementary and Integrative Health, 2016).

Another strength of the present study was the use of a national representative sample of adults. The NHIS provides nationally representative estimates on a wide range of health status and health utilization measures among the noninstitutionalized, nonmilitary population of the U.S. (CDC, National Center for Health Statistics, 2017). Each dataset can be used to examine the disease burden and access to care that individuals and families are currently experiencing in the U.S. (CDC, National Center for Health Statistics, 2017).

The NHIS also uses solid sampling techniques from a multi-stage area probability design in which geographic areas are sampled first, and then selected areas such as residences are sampled. Additionally, the NHIS oversampled AAs, Hispanics, and Asian Americans (CDC, National Center for Health Statistics, 2017). Persons in the adult selection process who self-identified as AA, Hispanic, or Asian and 65 years or older have an increased chance of being selected as the sample adult (CDC, National Center for Health Statistics, 2017).

Lastly, the Sociobehavioral Model of Complementary and Alternative Medicine (*SBM of CAM Use*) was used to identify predictors that enable and encourage the use of CAM modalities (Lorenc et al., 2009). It appeared to be the appropriate framework for the present study because it examined factors in the predisposing, enabling, need, and health behavior practices that could

potentially play a significant role in the use of safe, potentially unsafe, and neutral CAM.

Therefore, the *SBM* was the appropriate framework for the present study as it has the potential to address predictors of safe and unsafe CAM utilization for public health education research.

Effectiveness of the Sociobehavioral Model of CAM Use

Consistent with previous findings, the *SBM* is a useful framework to predict factors that are associated with the use of CAM (Upchurch & Rainisch, 2012; Upchurch and Rainisch, 2015). Specifically, findings from this study suggest women used or saw a practitioner for safe and unsafe CAM more than males. This result is consistent with previous studies on gender differences in the utilization of CAM services (Upchurch and Rainisch, 2012; Upchurch and Rainisch, 2015). Age was also a significant predictor of the use of CAM. The present study suggests older adults used safe and unsafe CAM less than younger adults. In contrast, older adults used multi-vitamin or mineral supplements more than younger adults. This finding suggests as adults age; they become more health conscious; however, they may not be able to engage in some activities due to health status or physical inabilities, which may increase their use of potentially unsafe CAM such as multi-vitamin or mineral supplements (Upchurch and Rainisch, 2012). Moreover, race, marital status, and education influenced the use of CAM.

Resources, access, availability, and geographic location also influenced the use of safe, potentially unsafe, and neutral CAM. Consistent with previous research, this study suggests higher income levels were associated with increased use of CAM (Upchurch and Rainisch, 2012). In contrast, lower income levels were associated with increased use of traditional healers. Additionally, participants who had insurance or were delayed medical care due to cost used or saw a practitioner for CAM more than those who did not have insurance or were not delayed medical care. As expected, region was a significant predictor for the use of safe and unsafe CAM.

Perceived and evaluated need were also significant predictors for the use of CAM modalities. Results from the present study indicate that the use of safe and unsafe CAM decreased as reported health status decreased, except for adults who practiced yoga, tai chi, and qi gong. Consistent with previous findings, adults who had not been diagnosed with a chronic health condition by a healthcare provider used CAM more than those who had been diagnosed; except for adults who used multi-vitamin or mineral supplements (Upchurch and Rainisch, 2012; Upchurch and Rainisch, 2015). This finding suggests adults may use multi-vitamin or mineral supplements to manage their chronic health conditions, which may cause adverse drug interactions with prescribed medications (Upchurch and Rainisch, 2012).

The results from this study also suggest that those who engaged in healthy behaviors (e.g., weekly moderate to leisure physical activity, abstaining from or quitting smoking, and obtaining a healthy BMI) were associated with increased use of safe and unsafe CAM. This result is consistent with previous findings and suggests individuals may be incorporating CAM as a wellness lifestyle approach (Upchurch and Rainisch, 2015). In contrast, current moderate to light drinkers used safe and potentially unsafe CAM more than former or lifetime abstainers, which suggests a link between alcohol consumption and the use of CAM. Further research is needed to examine the association between positive health behaviors and alcohol consumption (Upchurch and Rainisch, 2012).

Although the *SBM* has been used extensively in research, limited studies have used this framework to examine factors that enable safe and unsafe CAM modalities. These findings demonstrate the effectiveness of the *SBM* to assess predisposing, enabling, need, and health behavior practices in the context of safe and potentially unsafe CAM therapies.

Implications

The present study contributes to the literature by categorizing modalities into safe and potentially unsafe CAM. Findings from this study also provide new information on factors in the predisposing, enabling, need, and health behavior practices that influence the use of safe and potentially unsafe CAM among a national sample of adults. Additionally, the findings from this research support the use of the healthcare utilization framework (*SBM*) to understand predictors of CAM utilization.

Considering the lack of rigorous, well-designed clinical trials on most CAM modalities, the findings from the current study have significant implications for health educators, healthcare providers, and other health professionals. Overall, results from this study suggests adults used or saw a practitioner for unsafe CAM modalities more than safe modalities, and older, more educated women with higher incomes tended to use CAM more than others. While targeting all population groups is useful, specific attention to these groups are warranted.

Health educators. Health educators provide education on behaviors that promote health and wellness to target populations (Society of Public Health Education [SOPHE], 2018). As certified health education specialists, individuals are required to meet academic preparation qualifications by adhering to specific responsibilities and competencies (National Commission for Health Education Credentialing [NCHEC], 2018). Out of the seven areas of responsibility, area six states that health educators must serve as a resource and be able to disseminate accurate information related to health issues (NCHEC, 2018). Additionally, area seven states that health educators should advocate for the promotion of positive health practices and behaviors (NCHEC, 2018). Thus, certified health education specialists can provide up-to-date information in school, community, clinical, corporate, and other settings about specific CAM modalities as well as

strategies for determining if products and practices are safe and/or effective. Health educators can also serve as advocates, and work with legislation and policy to improve the safety of CAM.

With the growth of safe and potentially unsafe modalities, health educators need to be knowledgeable on the types of CAM, and the associated risks and benefits (Onal, Sahin, & Inanc, 2016; Pinzon-Perez, Palacio, & Fajardo, 2012). However, many health education programs do not offer CAM education as a part of the curriculum. As a result, many health educators lack the necessary skills to discuss commonly used CAM with their clients (Johnson, Priestley, Porter, Petrillo, 2010). Johnson et al. (2010) suggest the need for CAM education to be included in professional health education curricula (Johnson et al., 2010). By integrating CAM education into health education programs, future health educators can be better equipped with accurate information to disseminate to target populations (Johnson et al., 2010).

Healthcare professionals. Education and/or training on the use of CAM in schools of nursing, nutrition, medicine, and pharmacy are also needed so improvement in the disclosure of CAM can occur between patient and healthcare professionals (Gaylord & Mann, 2007). Previous studies have examined barriers associated with implementing CAM education and/or training in schools of health professions (Gaylord & Mann, 2007; Terry, Benn, Lie, Zeller, & Nedrow, 2007). However, these studies are dated and require additional studies to examine the effectiveness of these programs.

Health practitioners can also increase patient communication by developing a therapeutic physician-patient relationship (Jonas, 2000; Zolnierek & DiMatteo, 2009). Positive communication during a medical visit can help to facilitate patient involvement in decision making, provide an open discussion of benefits, risks, and barriers to adherence, and build rapport and trust with patients (Zolnierek & DiMatteo, 2009). Additionally, healthcare

professionals should offer verbal and nonverbal affirmation to positively reinforce patients for being proactive about their health (Jonas, 2000).

Another certified allied health professional, such as a Registered Dietitian Nutritionist (RDN), can provide education on how to detect fraud and quackery, which is especially prevalent in today's Internet health schemes [e.g., the use of fad diets and supplements] (Commission on Dietetic Registration, 2018; Sizer & Whitney, 2017). RDN are trained to use evidence-based science to provide advice and counseling about diet, food, and nutrition (Commission on Dietetic Registration, 2018; Sizer & Whitney, 2017). Patient education regarding the basics of weight control is essential because there is a direct link between replacing evidence-based weight-lowering methods with the use of CAM. Therefore, obtaining assistance from RDN can help to debunk popular weight loss schemes and provide valuable information regarding the health risks and benefits associated with the use of supplements (Sizer & Whitney, 2017).

Recommendations for Future Research

Millions of Americans use CAM to relieve pain associated with chronic illness, for general wellness, or treatment of health concerns (NIH, 2013). The current study provided information on the use of safe and potentially unsafe CAM modalities among a national sample of adults, however, the findings from this research indicate several suggestions for future research. National datasets should include culturally sensitive modalities. Although the use of CAM is higher for White adults, findings suggest various patterns of use by race are dependent on types of CAM (Barner et al., 2010; Institutes of Medicine, 2005). National surveys tend to underestimate health practices such as the use of home remedies or folk medicine, which can potentially increase an already widening minority gap in the use of CAM by the

underrepresentation of minority group practices (Institute of Medicine, 2005; Su & Li, 2011). The same may be true for religious practices, such as prayer. Religion is a vital practice among AAs and Hispanics. Many recognize the connection between religious or spiritual beliefs and health (Dessio et al., 2004), which may explain the heavy influence of individual prayer and alternative therapies. Therefore, there is a need for more culturally sensitive modalities in large representative samples that provide more accurate data on the use of CAM among minority populations.

Additionally, findings from the present study suggest participants who identified as White, AA, and Hispanic used or saw a practitioner for one or more unsafe CAM modalities more than one or more safe CAM modalities. To the researcher's knowledge, the present study is the first to categorize modalities as safe and potentially unsafe. Thus, additional research on findings from this study is needed.

Furthermore, future studies should continue to investigate the growth in provider-directed CAM, such as chiropractic or osteopathic manipulation, acupuncture, and massage. Financial barriers, especially in rural areas, are contributing factors in the increase in provider directed therapies. Research suggests traditional health services are limited in rural areas, which may cause patients to recoil from primary care facilities (Wardle, Lui, & Adams, 2012). Therefore, continued research in the connections between access to conventional medical care and CAM use, especially in rural areas is needed.

A significant finding in the present study was reported reasons for the use of massage. Inconsistent with previous studies, the present study suggests White and AA participants used the modality more for treatment and Hispanic participants reported using massage more for wellness and treatment combined. To the researchers' knowledge, limited research is available

on the use of massage among racial or ethnic minorities. Thus, future studies should ascertain the specific health condition and wellness purpose for the use of massage among a national sample of adults. However, findings from the present study are consistent with previous studies that suggest race, ethnicity, education, and income are significant predictors for the use of special diets (Leung et al., 2018; Rehm, Penalvo, Afshin, 2016). Therefore, further studies should examine why disparities exist in reported reasons for special diets.

Lastly, findings from the present study suggest nondisclosure for chiropractic or osteopathic manipulation and massage were higher among Hispanic and White participants. Conversely, nondisclosure for special diets was highest among Hispanic participants. This finding is consistent with previous research, which suggests disclosure differs based on the type of CAM used and differences in racial groups (Chao et al., 2008). Therefore, the present study outlines the need for additional education on the use of CAM to schools of nursing, medicine, pharmacy, and allied health professions so improvement in the disclosure of CAM can occur between patient and healthcare professionals. However, to achieve this, more rigorous, well-designed clinical trials are needed. Thus, continued research on evidenced-based CAM therapies is needed.

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APPENDIX A
IRB APPROVAL LETTER

March 28, 2018

Kristen A. Watts, MPH, CPST
Department of Health Science
The University of Alabama
Box 870311

Re: "Determinants for the Use of Complementary Health Approaches and Disclosure among Racial Groups: Results from a National Study"

Dear Ms. Watts,

This letter comes as a response to a request received on March 27, 2018 for a determination from the University of Alabama Institutional Review Board (IRB) regarding the above referenced dissertation research. Per your request, the proposed research will involve secondary data analysis using the public data set, the National Health Interview Survey. *In accordance with the UA IRB guidance document, "Public Datasets Approved for Secondary Analysis without IRB Review", the proposed project does not require approval from the IRB and is therefore excluded from review by the UA IRB.*

There is no further action required by the IRB for your research at this time. If you have any questions or if I can be of further assistance, please do not hesitate to contact me.

Sincerely,


Director & Research Compliance Officer
Office for Research Compliance

cc: Dr. Lori Turner

APPENDIX B

2012 NATIONAL HEALTH INTERVIEW SURVEY ITEMS

**2012 National Health Interview Survey
Family File**

Education of adult with highest education in family

- 01 Less than/equal to 8th grade
- 02 9-12th grade, no high school diploma
- 03 GED recipient
- 04 High school graduate
- 05 Some college, no degree
- 06 AA degree, technical or vocational
- 07 AA degree, academic program
- 08 Bachelor's degree, (BA, BS, AB, BBA)
- 09 Master's, professional, or doctoral degree
- 97 Refused
- 98 Not ascertained
- 99 Don't know

DURING THE PAST 12 MONTHS, has medical care been delayed for {you/anyone in the family} because of worry about the cost? (Do not include dental care)

- 1 Yes
- 2 No
- 7 Refused
- 8 Not ascertained
- 9 Don't know

Any family member have health insurance coverage?

- 1 Yes
- 2 No
- 7 Refused
- 8 Not ascertained
- 9 Don't know

Total combined family income (grouped)

- 01 \$0-\$34,999
- 02 \$35,000-\$74,000
- 03 \$75,000-\$99,000
- 04 \$100,000- and over
- 96 Undefined
- 99 Unknown

Have you EVER been told by a doctor or other health professional that you had ... Coronary heart disease?

- 1 Yes
- 2 No
- 7 Refused
- 8 Not ascertained
- 9 Don't know

Have you EVER been told by a doctor or other health professional that you had...A stroke?

- 1 Yes
- 2 No
- 7 Refused
- 8 Not ascertained

Have you EVER been told by a doctor or other health professional that you had...Cancer or a malignancy of any kind?

- 1 Yes
- 2 No
- 7 Refused
- 8 Not ascertained

Have you EVER been told by a doctor or other health professional that you had ... diabetes?

- 1 Yes
- 2 No
- 7 Refused
- 8 Not ascertained
- 9 Don't know

Have you EVER been told by a doctor or other health professional that you had ...weak/failing kidneys in the past 12 months?

- 1 Yes
- 2 No
- 7 Refused
- 8 Not ascertained
- 9 Don't know

Have you EVER been told by a doctor or other health professional that you had ...liver condition past 12 months?

- 1 Yes
- 2 No
- 7 Refused
- 8 Not ascertained
- 9 Don't know

**2012 National Health Interview Survey
Sample Adult File**

<p>[Are/Is] [you/person] now married, widowed, divorced, separated, never married, or living with a partner?</p> <p>Marital Status</p> <p>1 Married- spouse in household 2 Married-spouse not in household 3 Married- spouse in household unknown 7 Never married 8 Living with partner</p> <p>Race coded to single/multiple race group</p> <p>01 White only 02 Black/African American only 03 AIAN only 04 Asian only 05 Race group not releasable* 06 Multiple race</p> <p>Hispanic subgroup detail</p> <p>00 Multiple Hispanic 01 Puerto Rico 02 Mexican 03 Mexican-American 04 Cuban/Cuban American 05 Dominican (republic) 06 Central or South American 07 Other Latin American, type not specified 08 Other Spanish 09 Hispanic/Latino/Spanish, non-specific type 10 Hispanic/Latino/Spanish, type refused 11 Hispanic/Latino/Spanish, type not ascertained 12 Not Hispanic/ Spanish origin</p> <p>[Are/Is] [you/person] male or female?</p> <p>Sex</p> <p>1 Male 2 Female</p>	<p>Region</p> <p>1 Northwest 2 Midwest 3 South 4 West</p> <p>Age</p> <p>01-84 1-84 years 85 85+ years</p> <p>How often do you do LIGHT OR MODERATE leisure-time physical activities for AT LEAST 10 MINUTES that cause only LIGHT sweating or a SLIGHT to MODERATE increase in breathing or heart rate?</p> <p>Frequency light/moderate activity (times per week)</p> <p>00 Less than once per week 01-28 1-28 times per week 95 Never 96 Unable to do light or moderate activity 97 Refused 98 Not ascertained 99 Don't know</p>
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Alcohol drinking status:

Lifetime abstainer: < 12 drinks in lifetime; Former infrequent: 12+ drinks in lifetime but never as many as 12 in 1 year and none in past year; Former regular: 12+ drinks in lifetime, 12+ drinks in 1 year, but none in past year; Former unknown frequency: 12+ drinks in lifetime, none in past year, don't know if 12+ in any 1 year; Current infrequent: 12+ drinks in lifetime, and 1-11 drinks in past year; Current light: 12+ drinks in lifetime, and <= 3 drinks per week in past year; Current moderate: 12+ drinks in lifetime, and (male) >3 drinks per week up to 14 drinks per week OR (female) >3 drinks per week up to 7 drinks per week; Current heavier: 12+ drinks in lifetime, and (male) >14 drinks per week in past year OR (female) >7 drinks per week in past yr. (Average consumption).

- 01 Lifetime abstainer
- 02 Former infrequent
- 03 Former regular
- 04 Former, unknown frequency
- 05 Current infrequent
- 06 Current light
- 07 Current moderate
- 08 Current heavier
- 09 Current drinker, frequency/level unknown
- 10 Drinking status unknown

Some day smokers are persons who said they smoked some days, including those who reported smoking zero days in the past 30 days.

Smoking Status:

- 1 Current every day smoker
- 2 Current some day smoker
- 3 Former smoker
- 4 Never smoker
- 5 Smoker, current status unknown
- 9 Unknown if ever smoked
- How tall are you without shoes?
- Total height in inches
- 59-76 59-76 inches
- 96 Not available
- 97 Refused
- 98 Not ascertained
- 99 Don't know

BMI was calculated using the in-house version of the height and weight variables, which contain the greater range of height and weight values than are available on the public use file. The range of possible BMI values listed (0001-9994) does not reflect actual calculated BMI values at the extremes of the range, but rather, allows for the theoretical possibility of such unlikely values. (2) BMI = [Weight (kg)/[Height(m) squared]] rounded to 2 decimal places. Conversion factors: 1 kg = 2.20462 pounds; 1 meter (m) = 39.37008 inches. For both men and women, underweight is BMI < 18.5; healthy weight is BMI 18.5 to <25; overweight is BMI >= 25 to <30; obese is BMI >= 30.

Body Mass Index (BMI)

- 0001-9994 00.01-99.94
- 9995 99.95+
- 9999 Unknown

**2012 National Health Interview Survey
Adult Alternative Health/Complementary and Alternative Medicine File**

DURING THE PAST 12 MONTHS, did you see a practitioner for chiropractic or osteopathic manipulation?

- 1 Yes
- 2 No
- 7 Refused
- 9 Don't know

DURING THE PAST 12 MONTHS, did you see a practitioner for massage?

- 1 Yes
- 2 No
- 7 Refused
- 9 Don't know

DURING THE PAST 12 MONTHS, did you see a practitioner for acupuncture?

- 1 Yes
- 2 No
- 7 Refused
- 9 Don't know

DURING THE PAST 12 MONTHS, did you see a practitioner for energy healing therapy?

- 1 Yes
- 2 No
- 7 Refused
- 9 Don't know

DURING THE PAST 12 MONTHS, did you see a practitioner for naturopathy?

- 1 Yes
- 2 No
- 7 Refused
- 9 Don't know

DURING THE PAST 12 MONTHS, did you see a practitioner for hypnosis?

- 1 Yes
- 2 No
- 7 Refused
- 9 Don't know

DURING THE PAST 12 MONTHS, did you see a practitioner for biofeedback?

- 1 Yes
- 2 No
- 7 Refused
- 9 Don't know

DURING THE PAST 12 MONTHS, did you see a practitioner for ayurveda?

- 1 Yes
- 2 No
- 7 Refused
- 9 Don't know

DURING THE PAST 12 MONTHS, did you see a practitioner for chelation therapy?

- 1 Yes
- 2 No
- 7 Refused
- 9 Don't know

DURING THE PAST 12 MONTHS, did you see a practitioner for craniosacral therapy?

- 1 Yes
- 2 No
- 7 Refused
- 9 Don't know

DURING THE PAST 12 MONTHS, did you see....?

A Native American Healer or Medicine Man

- 1 Yes
- 2 No
- 7 Refused
- 9 Don't know

DURING THE PAST 12 MONTHS, did you see....?

A Shaman

- 1 Yes
- 2 No
- 7 Refused
- 9 Don't know

DURING THE PAST 12 MONTHS, did you see....?

A Curandero

- 1 Yes
- 2 No
- 7 Refused
- 9 Don't know

DURING THE PAST 12 MONTHS, did you see....?

A Yerbero

- 1 Yes
- 2 No
- 7 Refused
- 9 Don't know

DURING THE PAST 12 MONTHS, did you see....?

A Sobador

- 1 Yes
- 2 No
- 7 Refused
- 9 Don't know

DURING THE PAST 12 MONTHS, did you see....?

A Huesero

- 1 Yes
- 2 No
- 7 Refused
- 9 Don't know

DURING THE PAST 12 MONTHS, did you take multi-vitamins or multi-minerals?

- 1 Yes
- 2 No
- 7 Refused
- 9 Don't know

DURING THE PAST 12 MONTHS, have you taken any herbal or other non-vitamin supplements listed on this card for yourself?

- 1 Yes
- 2 No
- 7 Refused
- 9 Don't know

DURING THE PAST 12 MONTHS, did you see a practitioner for homeopathic treatment?

- 1 Yes
- 2 No
- 7 Refused
- 9 Don't know

DURING THE PAST 12 MONTHS, did you use...

Mantra, Meditation, including Transcendental Meditation, Relaxation Response, and Clinically Standardized Meditation?

- 1 Yes
- 2 No
- 7 Refused
- 9 Don't know

DURING THE PAST 12 MONTHS, did you use...

Mindfulness meditation, including Vipassana, Zen Buddhist meditation, Mindfulness-based Stress Reduction, and Mindfulness-based Cognitive Therapy?

- 1 Yes
- 2 No
- 7 Refused
- 9 Don't know

DURING THE PAST 12 MONTHS, did you use...

Spiritual meditation including Centering Prayer and Contemplative Meditation

- 1 Yes
- 2 No
- 7 Refused
- 9 Don't know

DURING THE PAST 12 MONTHS, did you use...

Guided Imagery

- 1 Yes
- 2 No
- 7 Refused
- 9 Don't know

DURING THE PAST 12 MONTHS, did you use...

Progressive relaxation

- 1 Yes
- 2 No
- 7 Refused
- 9 Don't know

DURING THE PAST 12 MONTHS, did you practice Yoga for yourself?

- 1 Yes
- 2 No
- 7 Refused
- 9 Don't know

DURING THE PAST 12 MONTHS, did you practice Tai Chi for yourself?

- 1 Yes
- 2 No
- 7 Refused
- 9 Don't know

DURING THE PAST 12 MONTHS, did you practice Qi Gong for yourself?

- 1 Yes
- 2 No
- 7 Refused
- 9 Don't know

DURING THE PAST 12 MONTHS, did you use a vegetarian, including Vegan diet for two weeks or more for health reasons?

- 1 Yes
- 2 No
- 7 Refused
- 9 Don't know

DURING THE PAST 12 MONTHS, did you use a macrobiotic diet for two weeks or more for health reasons?

- 1 Yes
- 2 No
- 7 Refused
- 9 Don't know

DURING THE PAST 12 MONTHS, did you use the Atkins diet for two weeks or more for health reasons?

- 1 Yes
- 2 No
- 7 Refused
- 9 Don't know

DURING THE PAST 12 MONTHS, did you use the Pritikin diet for two weeks or more for health reasons?

- 1 Yes
- 2 No
- 7 Refused
- 9 Don't know

DURING THE PAST 12 MONTHS, did you use the Ornish for two weeks or more for health reasons?

- 1 Yes
- 2 No
- 7 Refused
- 9 Don't know

DURING THE PAST 12 MONTHS, did you use...?

Feldenkrais

- 1 Yes
- 2 No
- 7 Refused
- 9 Don't know

DURING THE PAST 12 MONTHS, did you use...?

Alexander Technique

- 1 Yes
- 2 No
- 7 Refused
- 9 Don't know

DURING THE PAST 12 MONTHS, did you use...?

Pilates

- 1 Yes
- 2 No
- 7 Refused
- 9 Don't know

DURING THE PAST 12 MONTHS, did you use...?

Trager Psychophysical Integration

- 1 Yes
- 2 No
- 7 Refused
- 9 Don't know

First of top 3 most important therapies

- 01 Chiropractic or Osteopathic Manipulation
- 02 Massage
- 03 Acupuncture
- 04 Energy Healing Therapy
- 05 Naturopathy
- 06 Hypnosis
- 07 Biofeedback
- 08 Craniosacral therapy
- 09 Traditional Healers
- 10 [fill1: Herb 1 from CHB_TP21]
- 11 [fill1: Herb 2 from CHB_TP22]
- 12 Homeopathy
- 13 [fill3: Mantra meditation/ Mindfulness meditation/ spiritual meditation/guided imagery/ Progressive relaxation from CMB]
- 14 [fill4: Yoga/Tai chi/Qi Gong from CYG_MOST]
- 15 Special diets
- 16 Movement or exercise techniques
- 97 Refused
- 98 Not ascertained
- 99 Don't Know

Did you {fill1: see a practitioner for/use} {fill2: modality} for any of these reasons? For general wellness or general disease prevention

- 1 Yes
- 2 No
- 7 Refused
- 9 Don't know

**Did you {fill1: see a practitioner for/use}
{fill2: modality} for any of these reasons?
To improve your energy**

- 1 Yes
- 2 No
- 7 Refused
- 9 Don't know

**Did you {fill1: see a practitioner for/use}
{fill2: modality} for any of these reasons?
To improve your immune function**

- 1 Yes
- 2 No
- 7 Refused
- 9 Don't know

**Did you {fill1: see a practitioner for/use}
{fill2: modality} for a specific health
problem?**

- 1 Yes
- 2 No
- 7 Refused
- 9 Don't know

**[fill1: Not including the practitioner you
saw for] [fill2: modality] DURING THE
PAST 12 MONTHS, did you let your
personal health care provider know about
your use of [fill3: modality]?**

***If practitioner for therapy is the same
person as personal health care provider,
enter ‘**

- 1 Yes
- 2 No
- 7 Refused
- 9 Not ascertained
- 9 Don't Know

**2012 National Health Interview Survey
Person File**

**Would you say {your/ALIAS's} health in general is
excellent, very good, good, fair, or poor?**

Reported health status

- 1 Excellent
- 2 Very good
- 3 Good
- 4 Fair
- 5 Poor

APPENDIX C
LITERATURE REVIEW

Authors/ Date	Purpose	Participants	Methods/ Study Design	Results	Limitations	Theoretical Framework
Barner, Bohman, Brown, & Richards (2010)	To ascertain what predisposing, enabling, need, and disease state factors were related to CAM use among AAs.	2,952 AA adults ages 18 or older.	The 2002 National Health Interview Survey was employed (cross-sectional study design).	2,952 used CAM; 610 used CAM to treat a specific condition; CAM for treatment was significantly associated with graduate education, smaller family size, higher income, region depression/anxiety, more physician visits, frequent exercise behavior, and neck pain.	Unknown if participants used CAM for prevention; prayer may have been undervalued; use of CAM may have been underestimated because culturally sensitive examples familiar to AA were not used; respondents may not have interpreted questions as intended.	The Andersen Healthcare Utilization Model.
Bazargan, Chizobam, Hindman, Bazargan- Hejazi, Baker, Bell, & Rodriguez (2008)	To examine the correlates of CAM use in depressed underserved minority populations receiving medical care in primary care settings.	AA, Hispanic, and "other" adults that screened positive for depression.	Questionnaire; cross-sectional study design.	57% reported use of CAM for treatment of depressive symptoms; being moderately depressed, and self-reported health status were associated with increased frequency of CAM use for treatment of depression.	Researchers did not ask about the use of homeopathy, ayurveda, and traditional Chinese medicine.	Not specified.

Authors/ Date	Purpose	Participants	Methods/ Study Design	Results	Limitations	Theoretical Framework
Cuellar, Aycock, Chaill, & Ford (2003)	To determine if there was a difference between AA and White rural elders on the use of CAM and self-reported satisfaction with CAM.	183 AA and Caucasian adults ages 50 or older.	Descriptive, comparative, and cross-sectional study.	The most common form of CAM among rural elders include prayer, vitamins, exercise, meditation, herbs, chiropractic medicine, glucosamine, and music therapy.	Sampling bias and data were self-reported.	Not specified.
Factor-Litvak, Cushman, Kronenberg, Wade, & Kalmuss (2001)	To explore women's use of CAM and CAM practitioners, racial and ethnic differences in CAM use, and women's perceptions regarding the effectiveness of CAM.	300 White, Hispanic, and AA women; ages 18 to 80.	Questionnaire was administered; cross-sectional survey design.	Higher rates of self-administered remedies; less than half reported ever visiting a CAM practitioner; there were no specific differences between race/ethnicity groups on CAM utilization.	Small sample size; limited generalizability; interviews were in English only, which may have excluded a portion of the Hispanic population; combining CAM remedies and treatments into categories may have yielded overestimates.	Not specified.

Authors/ Date	Purpose	Participants	Methods/ Study Design	Results	Limitations	Theoretical Framework
Fortier, Gillis, Gomez, Wang, Tan, & Kain (2014)	To examine CAM beliefs in English and Spanish speaking Hispanic and White mothers of children undergoing surgery.	206 Hispanic and White mothers.	Administered questionnaire; cross-sectional survey design.	Both groups displayed a high degree of CAM use; the more education an individual had, the greater the use of different CAM modalities; English speaking White women indicated significantly more use of different CAM modalities than Spanish speaking Hispanic mothers.	The study may not have captured CAM therapies prevalent in Hispanic communities; Modalities presented may not have been phrased in terminology familiar to Hispanic and/or Spanish speaking families; convenience sampling strategy may have limited participants; limited generalizability of the findings.	Not specified.

Authors/ Date	Purpose	Participants	Methods/ Study Design	Results	Limitations	Theoretical Framework
Garland, Valentine, Desai, Li, Langer, Evans, & Mao (2013)	To determine the link between the use of CAM and the ability to find benefit in the cancer experience.	316 white and non-white adult cancer patients.	Questionnaire was administered; cross-sectional survey design.	193 participants reported CAM use following cancer diagnosis; patients using energy healing and healing arts reported significantly more benefit than nonusers; acupuncture, chiropractic, homeopathy, relaxation, yoga, and tai chi were not significantly associated with benefit in cancer experience.	Difficult to derive causal relationships between benefit finding and CAM use.	Not specified.

Authors/ Date	Purpose	Participants	Methods/ Study Design	Results	Limitations	Theoretical Framework
Grzywacz, Lang, Suerken, Quandt, Bell, & Arcury (2005)	To ascertain if CAM use for treatment of conditions or health maintenance differs among different ages and or race/ethnicity.	30,785 Hispanic, White, and AA adults.	Data were collected from the 2002 National Health Interview Survey (cross-sectional survey design).	Across all CAM groups, there was a curvilinear association between age and use (specifically those aged 45-54); few AAs used biologically based therapies and manipulative and body-based therapies and manipulative and body-based methods than non-Hispanic others and Whites.	Multivariate comparisons may be unbalanced; recall bias difficult to distinguish age from cohort effects.	Not specified.

Authors/ Date	Purpose	Participants	Methods/ Study Design	Results	Limitations	Theoretical Framework
Heathcote, West, Hall, & Trinidad (2011)	To understand the association between religiosity and CAM use among foreign-born Hispanic adults.	306 foreign born Hispanic adults.	Questionnaire was administered; cross-sectional study design.	Home and herbal remedies, traditional/folk massages, megavitamins, and chiropractic care were the most common forms of CAM; families who were religious were more likely to use forms of CAM than those who were not.	Individuals above the age of 65 were not represented as well as other ages; generalizability.	Not Specified.
Jernewal, Zea, Reisen, & Poppen (2005)	To determine the extent to which HIV-positive Latino gay and bisexual men used CAM and to explore the relationship between CAM use and adherence to treatment.	152 immigrant and US-born HIV positive Latino gay and bisexual men ages 18 years and older.	Questionnaire was administered; cross-sectional survey design.	80% of participants reported using some form of CAM. Asian CAM was the most common followed by herbal remedies; two thirds of the participants adhered to western medical care.	Conceptualization and measurement are not always accurate; factors not measured could contribute to CAM use and adherence (e.g. health insurance); limited generalizability due to study sample.	Not specified.

Authors/ Date	Purpose	Participants	Methods/ Study Design	Results	Limitations	Theoretical Framework
Jones, Utz, Wenzel, Steeves, Hinton, Andrews, Murphy, & Oliver (2006)	To determine the link between CAM use and spirituality in self-management of diabetes among AAs.	68 AA adults in two rural communities.	Focus group interviews were used to describe experiences in managing diabetes.	The most commonly used therapies were prayer, diet-based therapies, and natural products.	Study relied on self-reported information.	Not specified.
Malika, Desai, & Belliard (2017)	To assess herbal use among Hispanics, to explore the most commonly used herbs for ailments, and examine patients' disclosure of herb use to their physician.	318 Hispanic men and women.	Questionnaire was administered; Cross-sectional study design.	Approximately 90% of participants took herbal remedies; most were female; 40% used herbal teas; 75% believed that both herbal medicine and conventional medicine together could be effective in treating illness.	Self-report data; recall bias; socially desirability; sample may not be representative of other communities.	Not Specified.

Authors/ Date	Purpose	Participants	Methods/ Study Design	Results	Limitations	Theoretical Framework
Marshik, Kharat, Jakeman, Borrego, Dodd, Bachyrycz, Anderson, Bond, Deming, Mercier, Nawarskas, Ray, & Salazar (2016)	To describe the differences, attitudes, and experiences in the use of CAM in people living in New Mexico.	263 White, Hispanic, and "other" adults ages 18 or older or parents of patients younger than age 18 years.	Self-administered questionnaire; cross-sectional study design.	56% of respondents reported use of CAM in the previous 6 months; CAMT use was higher in females, people residing in urban areas, and those with higher education levels and household incomes.	Difficult to derive causal associations; response bias; Underrepresentation of the rural populations, and exclusion of patients unable to speak, read, and write in English; data was self-reported; self-selection bias.	Not specified.
Mbizo, Okafor, Sutton, Burkhart, & Stone (2016)	To estimate the prevalence of CAM use, to examine the role of BMI on CAM use on persons with chronic lower back pain, chronic neck pain, chronic/rheumatoid arthritis, or musculoskeletal disease.	9,725 adults with self-reported chronic neck or lower back pain, chronic/rheumatoid arthritis, or other musculo-skeletal disease ages 18 or older.	Questionnaire was administered; cross sectional survey design.	CAM use was significantly associated with the female sex, race/ethnicity, having chronic neck pain, lower back pain, or chronic/rheumatoid arthritis, having limitations due to chronic disease, and geographic region.	Study used data from 2007 (data may not reflect the current extent of CAM use in the U.S.) and data were self-reported.	Not specified.

Authors/ Date	Purpose	Participants	Methods/ Study Design	Results	Limitations	Theoretical Framework
Mikhail, Wali, & Ziment (2004)	To determine the frequency and pattern of use of alternative medicine among urban Hispanics.	179 Hispanic participants in California.	Questionnaires administered in churches; cross-sectional study design.	63% of respondents reported using alternative medicine (majority female); most commonly reported alternative therapies were herbs, prayer, and dietary supplements.	Underrepresentation of males; restriction to a single geographic area; survey did not distinguish between current and past use of alternative medicine; some may consider summon herbal teas as alternative "medicines" while others may not; recall bias.	Not Specified.
Munoz, Servin, Kozo, Lam, & Zuniga (2013)	To understand US and Mexican provider beliefs and perceptions regarding CAM use.	19 men and women who were HIV healthcare providers.	Qualitative study.	U.S. and Mexican providers recognize that CAM use is a common practice among their Latino patients; providers reported infrequent disclosure; almost half of providers did not routinely ask patients about CAM practices.	Non-generalizable due to the limited number of providers who were interviewed.	Grounded Theory.

Authors/ Date	Purpose	Participants	Methods/ Study Design	Results	Limitations	Theoretical Framework
Nguyen, Sorkin, Billimek, Kaplan, Greenfield, & Ngo- Metzger (2014)	To examine the use of CAM by ethnicity/race among patients with type 2 diabetes.	410 non- Hispanic White, Mexican American, and Vietnamese American patients with type 2 diabetes.	Questionnaire based on the California Health Interview Survey; cross sectional survey design.	Prevalence of CAM use varied among each group; Mexican Americans were reported higher levels of medication non- adherence due to cost; use of CAM practitioners were higher among Vietnamese Americans; Mexican Americans reported higher use of herbs and supplements; Vietnamese Americans reported higher use of both herbalists and acupuncturist.	Small sample size; study findings are limited to Southern California.	Not specified.

Authors/ Date	Purpose	Participants	Methods/ Study Design	Results	Limitations	Theoretical Framework
Rhee, Evans, McAlpine, & Johnson (2017)	To examine the frequency of CAM use by race/ethnicity and to identify health-related factors associated with CAM use among adults with moderate mental distress (MDD).	6,247 white, Black, Asian, Hispanic, and "other" adults ages 18 or older.	Data were collected from the 2012 National Health Interview Survey (cross-sectional survey design).	Nearly 40% of adults with MMD used CAM compared to 32% of those without MMD; being younger, female, living in the west, more educated, employed, and having more than 4 ambulatory care visits were associated with higher odds of CAM use.	Small sample reporting; CAM use specifically for mental health could not be investigated in depth; subgroups of each racial/ethnic group may have different patterns in CAM use; Researchers were unable to address differences due to the limited sample size.	Andersen Behavioral Model.
Ryder, Wolpert, Orwig, Pokras, & Black (2008)	To examine the relationship between CAM use in AAs and sociodemographic, health status, healthcare utilization and neighborhood factors.	95 AAs ages 60 and older.	Telephone survey; recruited through random-digit-dial (RDD) and community outreach; cross-sectional.	88.4% reported using CAM; commonly reported modalities were individual prayer, herbs/home remedies, and group spiritual practices.	Small sample size; low response to RDD recruitment; limited generalizability	Not specified.

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Schoenberg, Stoler, Kart, Perzynki, & Chapleski (2004)	To describe CAM use among a multi-ethnic group for diabetes self-management, to better understand the lay populations perspectives on CAM's utility and determine whether CAM practices challenge traditional diabetes self-management.	20 African American, Hispanic, Native Americans, and rural Whites who were had diabetes.	Mixed methods study.	One in four elders reported using CAM for managing their diabetes; CAM use was higher among Hispanic respondents than AA, Native American, or rural Whites; many used one modality of CAM for diabetes, except among AA and Native American participants, who reported CAM use for multiple modalities.	Exploratory research design, which limits generalizability of the results; possibility of confounding geographical and ethnic differences.	Not specified.
Tamhane, McGwin, Redden, Hughes, Brown, Westfall, Conn, Jonas, Smith, Brasington, Moreland, Bridges, & Callahan (2014)	To describe the frequency of CAM use regarding treatment, activities, and providers among AAs with rheumatoid arthritis (RA).	88 AA men and women. Mean age was 54 years old.	Data were collected from the National Institute of Arthritis and Musculoskeletal and Skin Disease; registry enrolled self-declared AA who were diagnosed with RA.	Frequency of CAM use was high among patients; those with longer disease duration were significantly more likely to use CAM for RA treatment than those with early disease diagnosis; women were significantly more likely to pray/attend church.	Difficult to derive causal associations; study forms were closed ended questions regarding CAM use- no open-ended questions or "other" practices were asked; CAM practices were self-reported.	Not specified.

Authors/ Date	Purpose	Participants	Methods/ Study Design	Results	Limitations	Theoretical Framework
Thorburn, Faith, Keon, & Tippens (2013)	To examine the relationship between discrimination in health care and CAM use.	6,008 multi- ethnic women ages 18 or older.	Telephone survey was administered; cross-sectional survey design.	The majority of respondents did not report experiencing discrimination in a healthcare setting; however, discrimination was significantly associated with the use of herbal medicines; one third of participants reported some use of CAM; only 19% reported using a practitioner.	Difficult to derive causal relationships between experiences of discrimination and use of CAM.	Not specified.

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Trangmar & Diaz (2008)	To investigate the use of CAM among Spanish- speaking Hispanics.	70 Hispanic adults living in South Carolina.	Recruitment from two primary clinics; questionnaire administered to participants.	69% of patients reported using CAM; herbal medicines, vitamins, or supplements, and foods were the most commonly used types of CAM; leading reason for using CAM was being taught to do so by family members, a failure by medical professionals to diagnose a problem, and lack of conventional medical treatments.	Response bias; Hispanic patients who did not speak Spanish were not included in the sample, limiting the generalizability; the sample was drawn from patients willing to complete the questionnaire on CAM use.	Not Specified.

Authors/ Date	Purpose	Participants	Methods/ Study Design	Results	Limitations	Theoretical Framework
Wanchai, Arner, & Stewart (2010)	To summarize research on CAM use among women with breast cancer.	Women with breast cancer (age not specified).	Systematic review from January 1990 through October 2009.	Biologically based practices were noted as the types of CAM most used by women with breast cancer, followed by mind- body medicine, whole medical systems, and energy medicine; sources of information about CAM use vary, including family , friends, mass media, healthcare providers, CAM providers, and self-help groups.	Data were self- reported; more randomized controlled trials are needed to provide information so that patients will be able to make informed choices about treatment; standardization of nomenclature for naming types of CAM was needed.	Not specified.
Ward, Humphries, Coats, & Whitfield (2015)	To better understand the use of chiropractic health care among AAs.	44 AA men and women.	Mail-out surveys to chiropractic doctors' offices; descriptive study design.	Most patients lived near their chiropractic doctor (CD); 81% claimed their CD explained things to them in an easy manner; 88% claimed their CD showed respect for what they had to say; 86% claimed their CD cared about them as a person.	Small sample size; results were not national attributes due to limited distribution of sample sizes.	Not specified.

Authors/ Date	Purpose	Participants	Methods/ Study Design	Results	Limitations	Theoretical Framework
Upchurch, Burke, Dye, Chyu, Jusunoki, & Greendale (2008)	To examine the relationship between acupuncture use among adult women by applying a Sociobehavioral model of utilization.	17,112 White, Black, Hispanic, and Asian adult women ages 18 or older.	2002 National Health Interview Survey (cross-sectional survey design).	Prevalence rates for acupuncture among women were low; multiple factors were associated with women's recent use of acupuncture services-many were associated with conventional health services.	No causal association between the model and patterns of acupuncture over time; no information available regarding the training of acupuncturists, clinical settings, and other experiences by women; no exhaustive set of variables to fill the Sociobehavioral model for each of the major domains.	Sociobehavioral Model of Acupuncture Use.
Upchurch & Rainisch (2012)	To test the modified version of the Andersen Behavioral Model of Health Services use with the use of CAM providers, products, and practices.	23,149 White, Black, Hispanic, and Asian adults ages 18 or older.	2007 National Health Interview Survey (cross-sectional survey design).	16.6% used providers, 18.8% used products, and 22.2% used practices; findings also suggest a significant association between multiple predisposing factors, enabling resources, need, and personal health practices.	Cross-sectional survey design, therefore causal associations can not be made.	Sociobehavioral Model of Use.

Authors/ Date	Purpose	Participants	Methods/ Study Design	Results	Limitations	Theoretical Framework
Upchurch & Rainisch (2014)	To provide updated data on the correlates of acupuncture use among US adults by applying the Sociobehavioral wellness model of utilization.	22,512 White, Black, Hispanic, and Asian adults ages 18 or older.	2007 National Health Interview Survey (Cross-sectional survey design).	Approximately 6.8% reported using acupuncture for a lifetime; over half the participants used it for wellness; users integrated conventional and acupuncture care for musculoskeletal conditions.	Difficult to derive causal association; low prevalence use of acupuncture (even though there was a large sample size).	Sociobehavioral Wellness Model.