# Racial/Ethnic Differences in the Use of Complementary and Alternative Medicine in US Adults With Moderate Mental Distress: Results From the 2012 National Health Interview Survey

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## Abstract

**Objectives:** To examine the prevalence of complementary and alternative medicine (CAM) use by race/ethnicity and to identify sociodemographic and health-related factors associated with CAM use among US adults with moderate mental distress (MMD). **Methods:** We analyzed data from the 2012 National Health Interview Survey (NHIS). We used data for 6016 noninstitutionalized US adults with MMD (3492 non-Hispanic whites, 953 non-Hispanic blacks, 1078 Hispanics, 268 Asians, and 225 others consisted of American Indian, Alaska Native, and those reporting multiple races). The 2012 NHIS asks about 36 types of CAM use in the past 12 months. We constructed (1) overall, any CAM use; (2) 5 major types of CAM use; and (3) individual types of CAM use indicators. Using a cross-sectional design with complex survey techniques, we estimated race/ethnicity-specific CAM prevalence, and odds of past year CAM use by race/ethnicity, sociodemographic, and health-related factors. **Results:** Nearly 40% of adults with MMD used CAM in the past year compared with 32% of those without MMD ($P < .001$). In adults with MMD, past year CAM use differed by race/ethnicity, ranging from 24.3% (blacks) to 44.7% (Asians) and 46.8% (others) ($P < .001$). Being younger, female, living in the west, higher education, being employed, more than 4 ambulatory care visits, and functional limitations were associated with higher odds of CAM use ($P < .01$). **Conclusions:** Adults with MMD use CAM more frequently than those without MMD. In addition, CAM use was significantly differed by race/ethnicity in adults with MMD. This underscores the need for good patient-provider communication and suggests opportunity for dialogue about integration between conventional providers and CAM practitioners to facilitate optimal mental health care.

## Keywords

complementary and alternative medicine (CAM), moderate mental distress (MMD), mental health, racial disparities, minority health

## Introduction

In 2012, approximately 43.7 million adults aged 18 years and older were identified with any mental illness (eg, depression and generalized anxiety disorders), which accounts for 18.6% of all US adults, in the preceding 12 months.[1,2] Recent studies indicate that the prevalence of mental illness among racial/ethnic minority adults varies, such that Asians had the lowest prevalence (13.9%) with American Indians and Alaska Natives having the highest prevalence (28.3%).[1,2] In the same study, Hispanics and black/African Americans had prevalence rates of 16.3% and 18.6%, respectively, which are slightly lower than that of white counterparts (19.3%).[1,2] Despite projections that racial/ethnic minorities will account for more than 40% of US citizens by 2025,[3] federal reports reveal that they have less access to available mental health services and are less likely to receive needed mental health care.[4,5] Untreated mental illness remains problematic as it is associated with comorbid physical conditions, shorter life expectancies, and

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other social burdens, including housing, employment, and criminal activities.[6]

A significant number of US adults reported using some form of complementary and alternative medicine (CAM) such that the prevalence of past year CAM use was 33.2% in 2012.[7] CAM is frequently used for mental health conditions, such as anxiety and depression,[8-10] due in part to unmet needs or delayed care from conventional medicine.[11] CAM represents a diverse array of health care practices and products that are considered unconventional,[12-14] and can be broadly classified as (1) alternative medical systems (eg, acupuncture and homeopathy), (2) biologically based therapies (eg, herbal remedies), (3) manipulative body therapies (eg, chiropractic therapies), (4) mind-body therapies (eg, yoga and tai chi), and (5) energy medicine (eg, craniosacral therapies).[15]

The increasing interest in CAM has led to an emergence in research addressing anxiety and/or depression.[16-20] In particular, recent systematic reviews have found promising evidence of some types of CAM for mental health conditions.[16-19] For example, acupuncture has shown to have positive benefits for generalized anxiety disorder,[20] and other mood disorders.[19] For biologically based therapies, herbal remedies, such as kava (*Piper methysticum*) and St John's wort (*Hypericum perforatum*),[19,20] have shown promise for reducing anxiety and mild to moderate depression, respectively. Yet, these remedies can be potentially harmful as they can cause several side effects, such as liver problems for kava, and nausea and sun sensitivity for St John's wort.[20] Mind-body therapies, such as mindfulness-based stress reduction (MBSR) and meditation,[21] tai chi,[22] and yoga[23] have also been shown to be effective in managing both anxiety and depression.[18-20] When used appropriately, CAM can also play a role in enhancing psychosocial aspects of health, by increasing hope, empowerment, self-efficacy, self-esteem, and social interactions.[24,25]

In the patterns of CAM use among US adults, existing literature shows that racial/ethnic differences exist in CAM use.[8,11,26,27] For example, non-Hispanic whites used at least 1 CAM therapy the most, followed by Asians, African/black Americans, and Hispanics.[11] Some patterns for specific racial/ethnic groups are also known. For instance, one study reported that Hispanics were more likely to use CAM when they could not afford or have limited access to conventional medicine.[27]

Despite potential benefits of CAM on mental health conditions, relatively little is known about racial/ethnic differences in the patterns of CAM use among US adults with mental distress. Mental distress is considered a prodrome for mental illness. Because degrees of mental distress vary by race/ethnicity,[28] and mental distress is associated with other serious outcomes (eg, serious mental illness), the potential role of CAM use as a preventive means for mental distress is an important question in these racially/ethnically diverse population groups.

To fill gaps in the literature, this article examines whether CAM use varies by racial/ethnic minority groups in this particular population of interest. More specifically, this study advances current literature by addressing 3 questions: First, do US adults with moderate mental distress (MMD) have a higher prevalence rate of CAM use than those who do not have MMD? If so, does the prevalence of CAM use vary by racial/ethnic minority groups in US adults with MMD? Second, what types of CAM are most frequently used by each racial/ethnic group in US adults with MMD? Third, which sociodemographic and health-related factors are associated with CAM use in these racially/ethnically diverse population groups in US adults with MMD?

We employ Andersen's behavioral model of health service use,[29] which is often used to understand sociodemographic and health-related factors associated with the utilization of health care services. In this model, Andersen defines three factors that are associated with the use of health care services. *Predisposing* factors are exogenous, such as demographic factors (eg, age, gender); *enabling* factors are resources (eg, health insurance) that are necessary, but not sufficient, for health service use; and *need* factors are perceived needs (eg, self-rated health status and chronic comorbid conditions) to seek health services.[29,30] Grounded in Andersen's behavioral model, our study will provide insights for health care policy and practice, as racial/ethnic minorities continue to increase in the United States and CAM may be a beneficial source for treating and/or managing mental distress in these populations.

## Methods

### Data Source and Study Sample

We used data from the 2012 National Health Interview Survey (NHIS), which is administrated by the Centers for Disease Control and Prevention (CDC).[31] The NHIS is an annual, cross-sectional, in-person household interview survey. It represents noninstitutionalized civilians and collects comprehensive health-related information to monitor health care trends in the United States.[31] Sponsored by the National Center for Complementary and Integrative Health (NCCIH), the NHIS uses a supplemental questionnaire to extensively collect information regarding the patterns of CAM use, including reasons, attitudes, and modalities of CAM, every 5 years.[32] In our analytic sample, we selected adults with MMD aged 18 years or older (n = 6247 unweighted). Using Kessler and colleagues' K6 scale, an indicator of nonspecific psychological distress,[33,35] MMD is defined as "necessitating mental health treatment and causing impairments in functioning. (p. 89)"[36] The K6 scale asks about frequency of 6 symptoms (eg, effort, hopelessness, nervousness,

sadness, restlessness/fidgety, and worthlessness) in the past 30 days. Each of these 6 items had a 5-point Likert-type response option ranging from (1) all of the time to (5) none of the time. We recoded these responses in the opposite direction, so that a higher score indicates a greater degree of mental distress. When aggregated, we used a cut-point of 5 and more to indicate MMD.[36] We excluded observations with missing covariate data (n = 231 unweighted), leaving the final sample size of 6016 (unweighted).

## Measures

*Dependent Variables.* We constructed 2 primary outcomes of interest for CAM use. First, we constructed a binary variable that captures the overall use of any CAM in the preceding 12 months. Second, because NHIS asks specifically about 36 different types of CAM in greater details, we categorized these types of CAM into the following 5 groups based on previous technical reports from CDC: alternative medical systems, biologically based therapies, manipulative body therapies, mind-body therapies, and energy healing therapies.[37,38] For each group, we constructed a binary variable (yes/no) indicating use of any CAM type in that group in the past 12 months. Additional information was captured for up to three CAM types an individual reported as the most important for their health in the past year. From this, we constructed a binary variable (yes/no), which captures reports of any of the top 3 types of CAM used specifically for mental health issues, including (1) feeling anxious, nervous, or worried; (2) attention deficit disorder/hyperactivity; (3) bipolar disorder; (4) depression; (5) insomnia or trouble sleeping; (6) memory loss or loss of other cognitive function; (7) phobia or fear; (8) frequent stress; or (9) other mental health disorders.

*Independent Variables.* Race/ethnicity was the primary independent measure of interest. We categorized respondents as non-Hispanic white (3492), non-Hispanic black/African American (953), Hispanic (268), Asian (1078), and others (consisted of American Indian, Alaska Native, and those reporting multiple races) (225).

*Control Variables.* Based on the Andersen behavioral model and previous studies,[8,10,11,26-29,39] we identified a number of potential covariates. For *predisposing factors*, we included age, gender, marital status (married, never married, and others), and geographic locations (Northeast, Midwest, South, and West). For *enabling factors*, educational attainment, annual family income (imputed),[40] health insurance coverage (yes/no), employment status, and usual source of care (yes/no) were included. For *need factors*, we included self-reported health status, ambulatory care visits, multiple comorbid conditions (MCCs),[41] and functional limitations (any/no).

## Data Analysis

First, we examined the extent to which sociodemographic and health-related characteristics differed in US adults with MMD by race/ethnicity. Then, we estimated the prevalence rate of CAM use in the same population of interest by race/ethnicity. We used cross-tabulations and design-based *F*-tests to investigate differences by race/ethnicity. Third, we conducted multivariate logistic regression analyses to identify factors associated with CAM use. We reported the odds of overall, any CAM use and odds of CAM use in each of the five major CAM groups. We used Stata 13.1[42] for all analyses and employed the *svy* commands in Stata to account for the complex sample design of the NHIS (ie, unequal probability of selection, clustering, and stratification).

## Results

### Sample Characteristics

Table 1 presents sociodemographic and health-related characteristics in US adults with MMD by race/ethnicity. There were statistically significant differences by race/ethnicity in all characteristics, except self-rated health status. Using Andersen's behavioral model of health service use, in *predisposing* factors, US adults with MMD are more likely to be female (59.1%), younger than 65 years (86.1%), married (41%), and reside in the south (36.6%). For geographic regions, 55.6% of Blacks were from the south, 50.3% of Asians were from the West, and 76.5% of Hispanics were from either southern or western regions. In terms of *enabling* factors, whites and Asians had greater proportions of (1) educational level of some college or higher, (2) annual family income of $60 000 or higher, and (3) health insurance coverage than any other racial/ethnic group. In terms of *needs* factors, blacks had the highest proportion of (1) poor, fair, or good self-rated health status (67.7%); (2) more than 4 ambulatory care visits (52.3%); and (3) more than 2 chronic conditions (40.3%) among racial/ethnic minority groups.

### Prevalence of CAM Use

Table 2 presents the prevalence of past year CAM use in US adults with MMD by race/ethnicity. Overall, 39.8% of adults with MMD reported having used at least one type of CAM in the preceding 12 months compared with 32.3% of the general adult population (*P* < .0001). Of these adults with MMD, 15.6% reported using CAM specifically for treating mental health conditions. Among adults with MMD, Asians (44.7%) and others (46.8%) reported using CAM the most, whereas blacks (24.3%) had the lowest prevalence of CAM use across racial/ethnic groups. The most common CAM types reported included biologically based therapies (22.1%), manipulative body therapies

**Table 1.** Selected Characteristics (Weighted Percent) of US Adults With Moderate Mental Distress by Race/Ethnicity, 2012 National Health Interview Survey.

| | White (n = 3492) | Black (n = 953) | Asian (n = 268) | Hispanic (n = 1078) | Others[a] (n = 225) | Total (n = 6016) | P |
|---|---|---|---|---|---|---|---|
| *Predisposing factors* | | | | | | | |
| Age, years | | | | | | | |
| 18-29 | 21.4 | 25.4 | 29.2 | 28.7 | 37.9 | 23.9 | <.0001 |
| 30-49 | 33.9 | 36.5 | 36.9 | 39.7 | 33.2 | 35.2 | |
| 50-64 | 28.8 | 28.4 | 21.2 | 20.6 | 22.0 | 26.9 | |
| 65+ | 15.9 | 9.8 | 12.7 | 11.0 | 6.9 | 13.9 | |
| Gender | | | | | | | |
| Female | 58.2 | 63.4 | 56.1 | 61.9 | 51.2 | 59.1 | .0355 |
| Male | 41.8 | 36.6 | 43.9 | 38.1 | 48.8 | 40.9 | |
| Marital status | | | | | | | |
| Married | 44.0 | 22.3 | 49.1 | 43.9 | 29.0 | 41.0 | <.0001 |
| Never married | 22.3 | 38.6 | 32.6 | 26.4 | 38.4 | 25.8 | |
| Others[b] | 33.8 | 39.2 | 18.3 | 29.8 | 32.6 | 33.2 | |
| Region | | | | | | | |
| Northeast | 16.4 | 18.1 | 13.1 | 13.8 | 5.1 | 15.7 | <.0001 |
| Midwest | 29.4 | 16.9 | 18.1 | 9.7 | 23.8 | 24.2 | |
| South | 34.2 | 55.6 | 18.5 | 36.9 | 32.8 | 36.6 | |
| West | 20.1 | 9.4 | 50.3 | 39.6 | 38.4 | 23.6 | |
| *Enabling factors* | | | | | | | |
| Educational attainment | | | | | | | |
| < High school | 14.3 | 25.1 | 11.8 | 43.1 | 20.8 | 20.2 | <.0001 |
| High school or equivalent | 29.8 | 27.1 | 20.2 | 23.4 | 22.8 | 27.9 | |
| Some college | 35.3 | 36.6 | 30.9 | 25.9 | 40.2 | 34.0 | |
| ≥College graduate | 20.6 | 11.2 | 37.2 | 7.7 | 16.2 | 17.9 | |
| Family income, $ | | | | | | | |
| <20 000 | 23.8 | 43.4 | 23.2 | 33.0 | 32.5 | 27.9 | <.0001 |
| 20 000-39 999 | 25.1 | 28.7 | 23.1 | 28.1 | 25.6 | 25.9 | |
| 40 000-59 999 | 17.7 | 12.2 | 13.5 | 19.5 | 21.3 | 17.3 | |
| ≥60 000 | 33.4 | 15.8 | 40.2 | 19.5 | 20.6 | 28.9 | |
| Employment status | | | | | | | |
| Employed | 42.2 | 36.9 | 51.3 | 47.4 | 42.0 | 42.7 | |
| Unemployed | 53.9 | 60.8 | 45.1 | 50.4 | 56.7 | 54.0 | .0008 |
| Others[c] | 3.9 | 2.3 | 3.5 | 2.2 | 1.3 | 3.3 | |
| Health insurance coverage | | | | | | | |
| Insured | 81.3 | 77.9 | 79.3 | 65.0 | 73.7 | 78.0 | <.0001 |
| Uninsured | 18.8 | 22.1 | 20.8 | 35.0 | 26.3 | 22.0 | |
| Usual source of health care | | | | | | | |
| Yes | 84.8 | 84.3 | 83.2 | 74.3 | 78.6 | 82.8 | <.0001 |
| No | 15.2 | 15.7 | 16.8 | 25.8 | 21.4 | 17.2 | |
| *Need factors* | | | | | | | |
| Self-rated health status | | | | | | | |
| Poor, fair, or good | 63.3 | 67.7 | 56.7 | 64.8 | 59.3 | 63.7 | .1289 |
| Very good, or excellent | 36.7 | 32.3 | 43.3 | 35.2 | 40.8 | 36.3 | |
| Ambulatory care visits[d] | | | | | | | |
| None | 13.4 | 16.2 | 20.4 | 23.5 | 14.0 | 15.6 | <.0001 |
| 1 | 10.0 | 11.1 | 15.2 | 10.7 | 15.9 | 10.6 | |
| 2-3 | 19.1 | 20.5 | 19.1 | 19.7 | 20.4 | 19.4 | |
| ≥4 | 57.6 | 52.3 | 45.3 | 46.1 | 49.7 | 54.4 | |

*(continued)*

**Table 1. (continued)**

| | White (n = 3492) | Black (n = 953) | Asian (n = 268) | Hispanic (n = 1078) | Others[a] (n = 225) | Total (n = 6016) | P |
|---|---|---|---|---|---|---|---|
| Multiple chronic conditions (MCCs) | | | | | | | |
| <2 | 59.6 | 59.7 | 74.7 | 70.3 | 66.4 | 62.1 | <.0001 |
| ≥2 | 40.4 | 40.3 | 25.3 | 29.7 | 33.7 | 37.9 | |
| Functional limitations | | | | | | | |
| Not limited | 33.9 | 37.3 | 52.8 | 45.4 | 34.6 | 36.8 | <.0001 |
| Limited, any way | 66.1 | 62.7 | 47.2 | 54.6 | 65.4 | 63.2 | |
| Sample size | | | | | | | |
| Unweighted sample | 3492 | 953 | 268 | 1078 | 225 | 6016 | |
| Weighted population | 24 896 123 | 4 610 328 | 1 362 873 | 5 982 175 | 1 357 864 | 38 209 363 | |

[a]Includes American Indian, Alaska Native, and multiple race categories.
[b]Includes widowed, divorced, separated, and living with a partner categories.
[c]Includes "with a job or business but not at work," and "working, but not for pay, at a family-owned job or business" categories.
[d]Excludes hospitalized overnight, visit to hospital emergency rooms, home visits, dental visits, or telephone calls.

(18.1%), and mind-body therapies (16.1%). Additional racial/ethnic differences exist within each major CAM type. For instance, the group of others reported using alternative medical systems (11.4%), biologically based therapies (28.5%), mind-body therapies (24.6%), and energy therapies (4.2%) more than any other racial/ethnic group. On the other hand, blacks reported using alternative medical systems (2.6%), biologically based therapies (12.8%), and manipulative body therapies (11.4%) the least, whereas Hispanics reported using mind-body therapies (9.5%) and energy therapies (0.6%) the least.

### Odds of CAM Use by Race/Ethnicity

Table 3 presents the results of 6 logistic regression models estimating the odds of any CAM use and odds of using each of the 5 major CAM types. Overall, after controlling for relevant covariates, statistically significant racial/ethnic differences persisted in each model. For instance, compared with non-Hispanic whites, blacks and Hispanics had significantly lower odds of overall CAM use by 48% and 31%, respectively. Similar patterns were shown in logistic regression models by major CAM type (see Table 3). There were no significant differences in overall CAM use between non-Hispanic whites and others. However, in the CAM type specific models, Others had 1.9 times higher odds of using alternative medical systems (95% CI = 1.1-3.3) and 3.3 times higher odds of using energy healing (95% CI = 1.5-7.3) in the past year than non-Hispanic whites. No significant differences in odds of any CAM use or specific CAM type use were detected between non-Hispanic whites and Asians.

### Predictors of CAM Use

We also identified sociodemographic and health-related factors associated with CAM use in this racially/ethnically diverse adult population with MMD. In *predisposing* factors, middle-aged adults (30-64 years) and being female were associated with significantly higher odds of any CAM use ($P < .05$) (see Table 3). When compared with those in the south, respondents from the west had 2.27 times higher odds of any CAM use ($P < .001$), and similar patterns were observed across other major CAM types (see Table 3).

In *enabling* factors, an educational level of bachelor's degree or higher had 3.78 times higher odds of any CAM use ($P < .001$) when compared with those who did not complete high school. Being employed had 1.42 times higher odds of any CAM use ($P < .001$), when compared with those who are unemployed. For *needs* factors, respondents who had more than four ambulatory visits had nearly twice the odds of any CAM use (odds ratio = 1.98; $P < .001$) when compared with those with no visits in the past year. Similarly, respondents with any functional limitations had 1.49 times higher odds of any CAM use ($P < .001$) compared with those without functional limitations in the past year. We observed similar patterns across all five major CAM types (see Table 3).

We also calculated predicted probabilities after running multivariate logistic regression models. When controlling for covariates, predicted probabilities of using any CAM among non-Hispanic whites and others were 43.7% and 45.6%, respectively. Predicted probabilities of using any CAM among non-Hispanic Asians, Hispanics, and non-Hispanic blacks were 37.8%, 35.9%, and 30.2%, respectively. We found similar patterns across 5 major CAM types (data not shown).

### Discussion

This is the first study to provide a population-based description of CAM use in U.S. adults with MMD by race/ethnicity. Our study suggests that adults with MMD had significantly

**Table 2.** Prevalence of Past Year Complementary and Alternative Medicine (CAM) Use in US Adults With Moderate Mental Distress (MMD) by CAM Type and Race/Ethnicity, 2012 National Health Interview Survey.

| | All Adults | | | Adults With MMD | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | MMD (n = 6016), % | No MMD (n = 27386), % | P | White (n = 3492), % | Black (n = 953), % | Asian (n = 268), % | Hispanic (n = 1078), % | Others[a] (n = 225), % | P |
| Overall, any CAM use | 39.8[b] | 32.3 | <.0001 | 44.3 | 24.3 | 44.7 | 30.7 | 46.8 | <.0001 |
| Alternative medical systems | 6.5 | 3.9 | <.0001 | 6.6 | 2.6 | 8.7 | 7.5 | 11.4 | .0003 |
| Acupuncture | 2.4 | 1.4 | <.0001 | 2.5 | 1.1 | 6.1 | 2.5 | 1.2 | .0031 |
| Homeopathy | 3.0 | 2.1 | .0017 | 3.4 | 1.0 | 2.4 | 2.1 | 6.0 | .0025 |
| Traditional healers | 1.0 | 0.3 | <.0001 | 0.3 | 0.4 | 0.8 | 3.4 | 3.9 | <.0001 |
| Others[c] | 1.5 | 0.8 | .0002 | 1.7 | 0.7 | 0.5 | 0.9 | 3.1 | .0416 |
| Biologically based therapies | 22.1 | 17.1 | <.0001 | 24.9 | 12.8 | 24.8 | 15.6 | 28.5 | <.0001 |
| Chelation | 0.1 | 0.0 | .5700 | 0.0 | 0.0 | 0.3 | 0.0 | 1.0 | <.0001 |
| Herbal supplements | 22.1 | 17.1 | <.0001 | 24.9 | 12.8 | 24.8 | 15.6 | 28.5 | <.0001 |
| Manipulative body therapies | 18.1 | 15.5 | .0003 | 21.0 | 11.4 | 15.1 | 12.5 | 14.0 | <.0001 |
| Chiropractic/osteopathic | 10.0 | 9.0 | .0704 | 12.4 | 4.2 | 5.4 | 6.1 | 6.2 | <.0001 |
| Massage | 11.0 | 8.4 | <.0001 | 11.9 | 8.6 | 12.2 | 8.7 | 10.2 | .0385 |
| Movement therapies | 1.5 | 1.6 | .5885 | 1.7 | 1.4 | 1.8 | 1.0 | 0.9 | .4924 |
| Mind-body therapies | 16.1 | 11.7 | <.0001 | 17.9 | 11.8 | 20.0 | 9.5 | 24.6 | <.0001 |
| Biofeedback | 0.3 | 0.1 | .0017 | 0.2 | 0.7 | 0.0 | 0.0 | 1.4 | .0411 |
| Meditation | 7.7 | 3.4 | <.0001 | 9.0 | 4.1 | 6.3 | 4.1 | 13.3 | <.0001 |
| Yoga | 9.9 | 9.2 | .1876 | 10.5 | 8.8 | 14.5 | 6.8 | 10.9 | .0155 |
| Tai Chi/Qi Gong | 1.4 | 1.3 | .4523 | 1.6 | 1.3 | 1.4 | 0.6 | 2.1 | .2457 |
| Others[d] | 5.5 | 2.3 | <.0001 | 6.7 | 2.1 | 2.1 | 2.3 | 11.0 | <.0001 |
| Energy therapies[e] | 1.3 | 0.8 | .0011 | 1.4 | 0.7 | 2.2 | 0.6 | 4.2 | .0034 |

[a] Includes American Indian, Alaska Native, and multiple race categories.
[b] In all, 15.6% of this group (n = 374) used any CAM specifically for mental health conditions.
[c] Includes Ayurveda and naturopathy.
[d] Includes guided imagery, progressive relaxation, and hypnosis.
[e] Includes energy healing and craniosacral therapies.

Table 3. Odds of Past Year Complementary and Alternative Medicine (CAM) Use in US Adults With Moderate Mental Distress (n = 5990) by CAM type, 2012 National Health Interview Survey.

| | Overall, Any CAM Use | | Alternative Medical Systems | | Biologically Based Therapies | | Manipulative Body Therapies | | Mind-Body Therapies | | Energy Therapies | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | OR | 95% CI | OR | 95% CI | OR | 95% CI | OR | 95% CI | OR | 95% CI | OR | 95% CI |
| **Racial/ethnic groups** | | | | | | | | | | | | |
| White | 1.00 | | 1.00 | | 1.00 | | 1.00 | | 1.00 | | 1.00 | |
| Black | 0.52*** | 0.41-0.66 | 0.48** | 0.28-0.80 | 0.58*** | 0.43-0.77 | 0.70* | 0.53-0.94 | 0.71* | 0.51-0.98 | 0.59 | 0.20-1.77 |
| Asian | 0.76 | 0.53-1.08 | 1.06 | 0.62-1.81 | 0.79 | 0.55-1.12 | 0.52** | 0.34-0.78 | 0.73 | 0.46-1.15 | 1.28 | 0.50-3.27 |
| Hispanic | 0.69** | 0.56-0.86 | 1.39 | 0.92-2.09 | 0.67** | 0.52-0.87 | 0.66** | 0.50-0.88 | 0.61** | 0.44-0.84 | 0.63 | 0.22-1.77 |
| Others[a] | 1.09 | 0.73-1.64 | 1.87* | 1.06-3.31 | 1.16 | 0.78-1.73 | 0.61* | 0.39-0.96 | 1.41 | 0.87-2.30 | 3.31** | 1.49-7.33 |
| *Predisposing factors* | | | | | | | | | | | | |
| **Age, years** | | | | | | | | | | | | |
| 65+ | 1.00 | | 1.00 | | 1.00 | | 1.00 | | 1.00 | | 1.00 | |
| 18-29 | 1.33 | 0.97-1.83 | 1.14 | 0.56-2.32 | 0.94 | 0.65-1.36 | 1.33 | 0.87-2.04 | 2.39*** | 1.56-3.65 | 0.56 | 0.15-2.05 |
| 30-49 | 1.44** | 1.11-1.87 | 2.03* | 1.17-3.55 | 1.03 | 0.76-1.39 | 1.34 | 0.96-1.86 | 2.48*** | 1.74-3.52 | 2.12 | 0.61-7.38 |
| 50-64 | 1.38* | 1.07-1.79 | 1.75* | 1.04-2.95 | 1.24 | 0.93-1.65 | 1.11 | 0.80-1.54 | 1.89*** | 1.34-2.66 | 2.00 | 0.67-6.00 |
| **Gender** | | | | | | | | | | | | |
| Male | 1.00 | | 1.00 | | 1.00 | | 1.00 | | 1.00 | | 1.00 | |
| Female | 1.23* | 1.05-1.44 | 1.42* | 1.05-1.92 | 1.04 | 0.86-1.25 | 1.30** | 1.07-1.58 | 1.55*** | 1.25-1.92 | 3.62*** | 1.79-7.31 |
| **Marital status** | | | | | | | | | | | | |
| Married | 1.00 | | 1.00 | | 1.00 | | 1.00 | | 1.00 | | 1.00 | |
| Never married | 1.09 | 0.87-1.37 | 1.36 | 0.95-1.93 | 1.13 | 0.85-1.49 | 0.82 | 0.61-1.09 | 1.37* | 1.02-1.84 | 2.21* | 1.00-4.86 |
| Others[b] | 1.04 | 0.87-1.24 | 0.91 | 0.66-1.25 | 1.01 | 0.81-1.26 | 0.94 | 0.74-1.17 | 1.18 | 0.95-1.47 | 1.77 | 0.96-3.25 |
| **Region** | | | | | | | | | | | | |
| South | 1.00 | | 1.00 | | 1.00 | | 1.00 | | 1.00 | | 1.00 | |
| Northeast | 1.32** | 1.07-1.62 | 1.97** | 1.22-3.18 | 1.12 | 0.86-1.48 | 1.24 | 0.94-1.64 | 1.31 | 0.95-1.80 | 0.91 | 0.38-2.17 |
| Midwest | 1.55*** | 1.26-1.92 | 1.25 | 0.80-1.96 | 1.54** | 1.20-1.97 | 1.44** | 1.11-1.88 | 1.16 | 0.88-1.54 | 2.34 | 0.97-5.64 |
| West | 2.27*** | 1.91-2.70 | 2.86*** | 1.95-4.19 | 2.10*** | 1.71-2.58 | 2.13*** | 1.70-2.66 | 2.12*** | 1.63-2.76 | 2.06 | 0.97-4.34 |
| *Enabling factors* | | | | | | | | | | | | |
| **Educational attainment** | | | | | | | | | | | | |
| <High school | 1.00 | | 1.00 | | 1.00 | | 1.00 | | 1.00 | | 1.00 | |
| High school or equivalent | 1.31* | 1.02-1.68 | 1.15 | 0.69-1.90 | 1.14 | 0.82-1.59 | 1.52* | 1.08-2.13 | 1.75** | 1.16-2.63 | 0.66 | 0.19-2.30 |
| Some college | 2.25*** | 1.79-2.83 | 2.10** | 1.35-3.25 | 2.00*** | 1.49-2.67 | 1.95*** | 1.45-2.61 | 3.68*** | 2.54-5.32 | 1.80 | 0.69-4.70 |
| ≥College graduate | 3.78*** | 2.88-4.96 | 3.55*** | 2.13-5.94 | 2.74*** | 1.96-3.84 | 3.02*** | 2.19-4.15 | 8.29*** | 5.48-12.54 | 4.04** | 1.45-11.25 |
| **Family income, $** | | | | | | | | | | | | |
| <20000 | 1.00 | | 1.00 | | 1.00 | | 1.00 | | 1.00 | | 1.00 | |
| 20000-39999 | 1.12 | 0.92-1.37 | 1.36 | 0.94-1.97 | 1.23 | 0.97-1.55 | 1.11 | 0.85-1.46 | 0.97 | 0.72-1.30 | 0.83 | 0.33-2.09 |
| 40000-59999 | 1.27* | 1.00-1.60 | 1.28 | 0.82-2.01 | 1.48* | 1.10-1.99 | 1.40* | 1.04-1.88 | 0.93 | 0.67-1.27 | 1.44 | 0.63-3.30 |

*(continued)*

**Table 3. (continued)**

| | Overall, Any CAM Use | | Alternative Medical Systems | | Biologically Based Therapies | | Manipulative Body Therapies | | Mind-Body Therapies | | Energy Therapies | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | OR | 95% CI | OR | 95% CI | OR | 95% CI | OR | 95% CI | OR | 95% CI | OR | 95% CI |
| ≥60000 | 1.40** | 1.13-1.73 | 1.41 | 0.91-2.18 | 1.3 | 1.00-1.70 | 1.59** | 1.18-2.13 | 1.03 | 0.77-1.38 | 1.45 | 0.59-3.54 |
| **Employment status** | | | | | | | | | | | | |
| Unemployed | 1.00 | | 1.00 | | 1.00 | | 1.00 | | 1.00 | | 1.00 | |
| Employed | 1.42*** | 1.18-1.71 | 1.09 | 0.77-1.56 | 1.46** | 1.16-1.83 | 1.72*** | 1.39-2.14 | 0.99 | 0.78-1.25 | 0.46* | 0.24-0.87 |
| Others[c] | 1.38 | 0.87-2.17 | 1.19 | 0.58-2.43 | 1.23 | 0.77-1.96 | 1.52 | 0.93-2.49 | 0.70 | 0.41-1.19 | 0.25 | 0.03-2.17 |
| **Health insurance coverage** | | | | | | | | | | | | |
| Insured | 1.00 | | 1.00 | | 1.00 | | 1.00 | | 1.00 | | 1.00 | |
| Uninsured | 1.14 | 0.93-1.40 | 1.21 | 0.83-1.76 | 1.17 | 0.92-1.49 | 1.26 | 0.97-1.64 | 1.09 | 0.83-1.44 | 1.17 | 0.56-2.41 |
| **Usual source of health care** | | | | | | | | | | | | |
| Yes | 1.00 | | 1.00 | | 1.00 | | 1.00 | | 1.00 | | 1.00 | |
| No | 1.08 | 0.85-1.39 | 1.74* | 1.11-2.71 | 1.04 | 0.79-1.37 | 1.07 | 0.79-1.44 | 0.98 | 0.73-1.31 | 1.22 | 0.47-3.12 |
| *Need factors* | | | | | | | | | | | | |
| **Self-rated health status** | | | | | | | | | | | | |
| Poor, fair, or good | 1.00 | | 1.00 | | 1.00 | | 1.00 | | 1.00 | | 1.00 | |
| Very good, or excellent | 1.24* | 1.05-1.48 | 1.06 | 0.75-1.49 | 1.13 | 0.93-1.39 | 1.30* | 1.04-1.62 | 1.36** | 1.08-1.70 | 1.21 | 0.67-2.19 |
| **Ambulatory care visits[d]** | | | | | | | | | | | | |
| None | 1.00 | | 1.00 | | 1.00 | | 1.00 | | 1.00 | | 1.00 | |
| 1 | 1.29 | 0.93-1.78 | 1.35 | 0.67-2.72 | 1.18 | 0.80-1.72 | 1.24 | 0.78-1.97 | 0.98 | 0.65-1.47 | 7.34** | 2.11-25.52 |
| 2-3 | 1.52** | 1.17-1.98 | 2.37** | 1.36-4.14 | 1.21 | 0.89-1.65 | 1.52* | 1.06-2.20 | 1.27 | 0.89-1.81 | 9.88** | 2.69-36.28 |
| ≥4 | 1.98*** | 1.56-2.51 | 2.35** | 1.35-4.09 | 1.30* | 1.00-1.70 | 2.66*** | 1.85-3.82 | 1.48* | 1.07-2.05 | 9.19*** | 2.78-30.36 |
| **Multiple chronic conditions (MCCs)** | | | | | | | | | | | | |
| <2 | 1.00 | | 1.00 | | 1.00 | | 1.00 | | 1.00 | | 1.00 | |
| ≥2 | 0.92 | 0.75-1.12 | 1.02 | 0.70-1.50 | 1.00 | 0.81-1.23 | 0.90 | 0.71-1.15 | 0.71** | 0.57-0.90 | 0.68 | 0.33-1.41 |
| **Functional limitations** | | | | | | | | | | | | |
| Not limited | 1.00 | | 1.00 | | 1.00 | | 1.00 | | 1.00 | | 1.00 | |
| Limited, any way | 1.49*** | 1.24-1.78 | 1.72** | 1.21-2.44 | 1.48*** | 1.19-1.85 | 1.51** | 1.19-1.90 | 1.32* | 1.05-1.66 | 0.94 | 0.46-1.93 |
| Design df | 300 | | 300 | | 300 | | 300 | | 300 | | 300 | |
| *F*-statistic | 16.95*** | | 6.05*** | | 8.84*** | | 11.22*** | | 13.69*** | | 5.24*** | |

[a]Includes American Indian, Alaska Native, and multiple race categories.
[b]Includes widowed, divorced, separated, and living with a partner categories.
[c]Includes "with a job or business but not at work," and "working, but not for pay, at a family-owned job or business" categories.
[d]Excludes hospitalized overnight, visit to hospital emergency rooms, home visits, dental visits or telephone calls.
* $P < .05$. ** $P < .01$. *** $P < .001$.

higher prevalence of CAM use than those who do not have MMD. Also, the prevalence of CAM use varied by race/ethnicity such that Blacks and Hispanics were less likely to use CAM than other racial/ethnic groups. Furthermore, we observed several patterns in CAM use among those with MMD, which differed by race/ethnicity.

Our finding of more frequent CAM use in adults with MMD compared with adults without MMD has important implications for optimizing patient care in clinical practice. Conventional providers (eg, primary care physicians and psychiatrists) should actively query about their patients' CAM use and monitor potential side effects, including drug-herb interactions. CAM practitioners should also be aware that CAM-seeking individuals may have underlying mental distress issues that are substantial enough to warrant referral to mental health specialists. Additionally, better communication and coordination of care between conventional providers and CAM practitioners would be helpful in optimizing mental health care.[43]

When compared with results for the general adult population, our results of CAM use in adults with MMD have both similarities and differences. First, we found blacks and Hispanics to have substantially lower prevalence rates of CAM use compared with non-Hispanic whites, Asians, and others with MMD. While previous studies of the general population have observed similar results to ours for blacks and Hispanics when compared with non-Hispanic whites,[11,27,44] others have found CAM use to be equally prevalent across all racial/ethnic groups in the general population.[45] These differences may be due to discrepant definitions of CAM, sampling design issues in different data sources, and/or different populations of interest. It is also possible that such differences can be attributed to unique factors related to MMD. Future studies are needed to better understand the relationship between the role of cultural backgrounds and traditional beliefs in specific racial/ethnic groups and CAM use in adults with MMD.[46-48]

We also found a significant variation in individual types of CAM most frequently used by race/ethnicity. Most notably, when compared with other racial/ethnic minority groups, Asians and others had higher prevalence of utilizing biologically based therapies (eg, herbal supplements), mind-body therapies (eg, biofeedback, yoga, and tai chi), and energy therapies. This is not surprising since most of these CAM types originated from Asian and American Indian cultures.[47] Future research, however, is needed to better understand the reasons for utilizing CAM in Asians and others with MMD. In particular, it is of question whether Asians and others use CAM to specifically address their mental distress issues, and if so, whether they use it safely.

On the other hand, blacks used alternative medical systems, biologically based therapies, and manipulative body therapies the least, and Hispanics used mind-body therapies and energy therapies the least. As suggested by Su and Li,[11]

a possible reason may be a lack of cultural exposure and knowledge of these CAM types among blacks and Hispanics. Another explanation drawn from our findings is that blacks were the least employed and Hispanics were the least insured, suggesting that there may be a possible socioeconomic deterrent to using CAM in these racial/ethnic groups.

In our multivariate logistic regression models, racial/ethnic differences in CAM use persist even when controlling for other relevant factors. For instance, while blacks and Hispanics together made up more than one-third of the adults with MMD, they consistently had lower odds of CAM use than non-Hispanic whites. Furthermore, we found factors associated with CAM use in these racially/ethnically diverse groups with MMD, which are similar to previous studies. When we considered Andersen's behavioral model of health service use,[29] *predisposing* factors, including being middle aged (30-64 years), female, and living in the west, were associated with higher odds of any CAM use.[27,44] *Enabling* factors of higher educational attainment and employment, and *needs* factors of more than 4 ambulatory care visits and some form of functional limitations, were also associated with higher odds of any CAM use.[9,27] These findings suggest that demographics, socio-economic resources, and clinical factors are equally important for the likelihood of CAM use in adults with MMD.

There are several limitations in our study. First, while we primarily focused on the prevalence of overall CAM use among US adults with MMD, we also found that nearly 1 in 6 CAM users with MMD reported using CAM to treat or manage mental health–related symptoms. Because of limitations of the data collected and the small sample reporting CAM use for specifically for mental health, we could not thoroughly investigate CAM use for mental health–related symptoms. However, reasons for CAM use aside, it is still critical for providers to be aware that adults with MMD are a population with higher prevalence of CAM use overall. Future research is needed to better understand reasons for CAM use in this population. Second, subgroups of each racial/ethnic group (eg, Chinese vs Korean in Asians) may have different patterns in CAM use. We were unable to fully address such differences due to the limited sample size in given racial/ethnic minority groups. Group-specific analyses should be done with larger sample size in the future to explore potential subgroup differences.

In conclusion, adults with MMD use CAM more frequently than those without MMD. This underscores the importance of good patient-provider communication about CAM use and suggests new opportunity for dialogue about avenues for communication and potential integration between conventional providers and CAM practitioners to facilitate optimal mental health care. Similar to the general population, there are substantial racial/ethnic differences in CAM use among adults with MMD warranting future

research regarding the reasons for CAM use among those with MMD and barriers and facilitators to accessing safe and appropriate CAM in these racially/ethnically diverse population groups.

## Authors' Note

## Declaration of Conflicting Interests

## Funding

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