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## Factors associated with the use of mind body therapies among United States adults with musculoskeletal pain☆

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### Summary

**Objective**—To determine the prevalence of mind body therapy use and correlates of use among adults with prolonged musculoskeletal pain, a group for whom mind body therapies are recommended.

**Design**—The U.S. 1999 National Health Interview Survey. Prolonged musculoskeletal pain was defined as any soft tissue, joint, or bony pain for at least 1 month. Analyses used SUDAAN and reflect national estimates.

**Main outcome measures**—Use of mind body medicine (relaxation techniques, imagery, biofeedback, and hypnosis) and prayer in the previous year.

**Results**—Respondents ( $n = 6079$ ) with musculoskeletal pain were almost twice as likely as those without ( $n = 24,722$ ) to use mind body medicine (9% versus 5%, respectively,  $p < .0001$ ) and prayer (20% versus 12%, respectively,  $p < .0001$ ). After adjustment, men were less likely than women to use mind body medicine (odds ratio 0.55 [0.43–0.71]) and prayer (odds ratio 0.56 [0.48–0.66]). Those who had a high school education were less likely than those with training beyond high school to use mind body medicine (odds ratio 0.36 [0.28–0.47]) and prayer (odds ratio 0.61 [0.52–0.71]).

**Conclusions**—Mind body therapies are not used commonly by adults with prolonged musculoskeletal pain. Understanding barriers to their use may facilitate wider application in this population.

### Introduction

Persistent and chronic pain affects approximately 30% of the United States population<sup>1,2</sup> yet remains one of the most vexing health conditions to treat. The 1996 NIH Consensus Panel recommended use of mind body therapies as adjunctive therapy for chronic pain.<sup>3</sup> Since

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then there has been growing support for the efficacy of certain mind body therapies in the treatment of chronic pain symptoms.<sup>4–7</sup> In addition, mind body therapies are relatively inexpensive<sup>8–10</sup> and have a favorable safety profile.<sup>7</sup> A recent nationally representative survey of 2055 individuals found that chronic pain was the third most-common reason (19.5%) for U.S. adults to use mind body therapies and was reported to be “very useful” for that condition by 55% of users.<sup>11</sup> The most prevalent mind body therapies include prayer, relaxation techniques, guided imagery, hypnosis, and biofeedback.<sup>12,13</sup> The mechanism by which mind body therapies may alleviate pain is not well established, but may result from their ability to modify the cognitive and emotional components of pain perception known as pain unpleasantness and pain affect.<sup>14–16</sup>

There is also emerging evidence that mind body therapies facilitate patient empowerment and other patient-centered outcomes.<sup>3,17</sup> Finally, to the extent that mind body therapies emphasize self-care, they may result in decreased utilization of the health care system. In this context we sought to determine the prevalence of use of mind body therapies among patients with musculoskeletal pain and identify the sociodemographic factors, health conditions, and health behaviors associated with their use.

## Patients and methods

### Data source

We used data collected from the Adult Sample Module of the 1999 National Health Interview Survey (NHIS), a continuing, in-person household survey of the civilian, noninstitutionalized U.S. population that is conducted by the Census Bureau for the National Center for Health Statistics.<sup>18</sup> The core survey elicited information on sociodemographic factors (including age, gender, race, highest level of education achieved, region of the U.S., marital status, birthplace, health status, insurance status, and annual household income), health conditions (including ever-diagnosis of coronary artery disease, hypertension, asthma, peptic ulcer disease, cancer, diabetes, inflammatory bowel disease, arthritis and other types of musculoskeletal pain, and anxiety or depression within the last 12 months), self-reported health status, and health behaviors (level of physical activity, alcohol intake, and smoking status). In 1999, 97,059 persons from 37,573 households and 38,171 families participated in the core survey. In addition, one randomly selected adult per household 18 years or older also completed the Sample Adult Module ( $n = 30,801$ ), which elicited other information including use of mind body therapies. The combined response rate to both components of the survey was 69.6%.

### Use of mind body medicine and prayer

Respondents to the Adult Sample Module component of the NHIS were asked about their use of 11 complementary and alternative medical (CAM) health care services during the previous year: “During the past 12 months have you used acupuncture, relaxation techniques, massage therapy, imagery, spiritual healing/prayer, lifestyle diets, herbal medicine, homeopathic treatment, energy healing, biofeedback, hypnosis, or other alternative therapy or treatment?” Respondents were not asked about the specific reason for use of any particular CAM modality.

We used the National Center for Complementary and Alternative Medicine (NCCAM) definition of mind body therapies as “techniques designed to enhance the mind’s capacity to affect bodily function and symptoms.” Accordingly, we classified four therapies as mind body medicine (relaxation techniques, imagery, biofeedback, hypnosis) and considered spiritual healing/prayer as a separate mind body therapy.<sup>19</sup> We made this distinction based on prior evidence that the characteristics of respondents who pray and the reasons for use of prayer may differ from that of other mind body therapies.<sup>11,20</sup> For purposes of clarity, when we refer to mind body medicine in this paper we refer to four mind body therapies only (relaxation techniques, imagery, biofeedback, and hypnosis); prayer will be referred to separately.

Respondents who answered yes to any of these four CAM therapies were considered to have used mind body medicine. All others were classified as not using mind body medicine. The prayer variable was coded in the same manner.

### Study sample

We studied 30,801 respondents to the Adult Sample Person component of the NHIS. We focused on 6079 respondents who reported musculoskeletal pain by responding affirmatively to the following question: “During the past 12 months, have you had pain, aching, stiffness or swelling in or around a joint?” and who suffered pain on most days for at least one month. Data were not available on the duration of pain beyond 30 days. Because the focus of this study was on prolonged musculoskeletal pain, we did not include responses to questions about headache, back, and neck pain in our definition as they were only asked of pain in the past 3 months. Nevertheless, respondents who answered these questions affirmatively would be likely to answer the above question affirmatively if pain was present in the past 12 months. We considered factors previously reported in the literature as potential correlates of use of mind body medicine and prayer in our analyses.<sup>11,20</sup> Factors studied included sociodemographic characteristics: age (<30, 30–39, 40–49, 50–64, 65+), gender, race (non-Hispanic white, non-Hispanic black, Hispanic, other), highest education level achieved (no high school, completed high school or equivalent, any higher education), region of the U.S. (Northeast, Midwest, South, West), marital status (married, not married), birthplace (U.S. born, foreign-born), and annual household income (<20 K, 20– <55 K, 55– <75 K, 75 + K). Respondents were queried about specific health conditions using the question “Have you ever been told by a physician or other health professional that you had [...]?” Self-reported health conditions included coronary artery disease (heart disease, angina pectoris, heart attack/myocardial infarction), hypertension, diabetes (excluding gestational diabetes), asthma, peptic ulcer disease, cancer, and inflammatory bowel disease. Additional self-reported health conditions included depression or anxiety during the previous 12 months and health status (excellent, very good, good, fair, poor). Health behaviors included physical activity, alcohol use, and smoking status. Physical activity was classified as active (defined as vigorous exercise for at least 10 min on at least three occasions per week) versus less active. Alcohol use was classified into three groups: (1) current non-drinker (including lifetime abstainers and former drinkers who had not consumed alcohol in the past year), (2) current users who consume alcohol on fewer than 5 days per week and (3) current users who consume alcohol on 5 or more days of the week.

Smoking status was classified as current smokers (respondents who reported that they smoke on at least some days) versus others.

### Statistical analysis

All analyses used SAS-callable SUDAAN version 8.1<sup>21</sup> to obtain proper variance estimates that account for the complex sampling design. All results were weighted to reflect national estimates.

We estimated the prevalence of use of mind body medicine and prayer among persons with musculoskeletal pain in the U.S. We examined each outcome of interest (use of mind body medicine and prayer) separately. We used Chi-square tests to examine the bivariable relationship between the outcome of interest (e.g., use of mind body medicine) and sociodemographic characteristics, health conditions, and health behaviors. Factors associated with use of mind body medicine at  $p = 0.15$  were included in a multivariable logistic regression model to determine independent correlates of use of mind body medicine. Backward elimination was used with a threshold of  $p < 0.05$  for retention in the model. We evaluated factors for potential confounding by adding them back into the final model one-by-one and examining changes in the estimated beta-coefficients for each of the other factors in the model. Variables that produced a 10% change in the estimated beta-coefficient for any factor in the model were considered con-founders and included in the final model. This process was repeated for prayer.

The Harvard Medical School institutional review board approved this study. No authors have any conflicts of interest, either financial or personal.

### Results

Of the 30,801 adult respondents, 6079 (20%), representing an estimated 37 million people nationally, reported musculoskeletal pain of at least one month's duration. The distribution of pain locations for these 6079 respondents is demonstrated in Table 1. Overall, 72% of respondents reported pain in two or more joints. Knees were the most common site of pain, followed by shoulders, fingers/thumbs, ankles, hips, and wrists. Osteoarthritis was the most common self-reported etiology (22%), followed by rheumatoid arthritis (15%) and bursitis (15%).

The characteristics of respondents with and without musculoskeletal pain are shown in Table 2. Respondents with musculoskeletal pain were more likely to be over age 50, non-Hispanic white, female, and U.S. born. They were less likely to have formal education beyond high school. Those with musculoskeletal pain were more than twice as likely as those without pain to have a history of peptic ulcer disease, cancer, and depression. Respondents who reported pain were less likely to be physically active. Overall, an estimated 3.5 million people used mind body medicine, while prayer was used by about 7.4 million people. Compared to respondents without musculoskeletal pain, those with musculoskeletal pain were almost twice as likely to use mind body medicine (9% versus 5%, respectively) and prayer (20% versus 12%, respectively). Relaxation techniques were by far

the most commonly used sub-category of mind body medicine, followed by imagery, biofeedback, and hypnosis.

Among respondents with musculoskeletal pain, there were several similarities between users of mind body medicine/prayer and non-users (Table 3). For example, users of mind body medicine and prayer were less often elderly and less often male as compared with nonusers. Additionally, users of mind body medicine and prayer were more often born in the U.S. and had more formal education beyond high school. Marital status did not differ significantly between users of prayer and non-users, while users of mind body medicine were less likely to be married than non-users.

Table 4 presents the prevalence of mind body medicine and prayer use as well as adjusted odds ratios for factors independently associated with use of these CAM modalities in the previous 12 months among respondents with musculoskeletal pain. The odds of use of mind body medicine were about three among younger respondents as compared to those over 65 years old. Similarly, the odds of use of mind body medicine among depressed respondents were about two as compared to those who were non-depressed. Odds of use of mind body medicine among Hispanic respondents were half those of whites, and among men were half those of women. Respondents who had not completed high school were less likely to use mind body medicine compared to those who had had at least some college education.

Table 5 presents the prevalence of prayer use and adjusted odds ratios for factors independently associated with the use of prayer in the previous 12 months among respondents with musculoskeletal pain. Respondents younger than age 65 were more likely to use prayer as compared to the elderly, though this relationship did not reach statistical significance in those under 30 years old. History of coronary artery disease had the strongest association with prayer, followed by history of depression, cancer, and peptic ulcer disease. History of depression was the only clinical factor associated with increased use of both mind body medicine and prayer.

## Discussion

We found that while mind body medicine and prayer were used almost twice as frequently by respondents with musculoskeletal pain than those without musculoskeletal pain, rates of use of these therapies are still infrequent. Less than one out of ten respondents with musculoskeletal pain indicated that they had used at least one mind body therapy in the past 12 months. The use of prayer in this group was more than twice that of mind body medicine: about one in five respondents. Men were less likely than women to use either modality. Although the level of education was the strongest correlate of use of mind body medicine, the effect size was reduced for prayer. Respondents living in the northeastern United States were less likely to use prayer, while those living in the West were more likely to use mind body medicine.

In light of the NIH Consensus Panel recommendations and the literature supporting the use of mind body therapies for musculoskeletal pain,<sup>3,22,23</sup> the finding that these therapies are used infrequently suggests that there may be important barriers to their use. These barriers

may arise at the patient, physician/provider, or institutional level. Patients themselves may reject mind body therapies if they are resistant to the notion that any mental process could be contributing to their symptoms,<sup>24–26</sup> or they may have difficulty adhering to the daily self-care practices often associated with mind body therapies (which require a level of discipline similar to that required by a physical exercise regimen).<sup>27</sup> Another explanation is that respondents in our study may have tried mind body therapies more than 12 months ago and did not find them to be useful, or tried other therapies that proved highly effective for their pain. Perhaps the out-of-pocket expenses associated with these therapies discourage their use. At the provider level, pain specialists do not refer patients for mind body therapies as often as they do for other behavioral interventions such as counseling or psychotherapy.<sup>28</sup> This may be due to the perception that use of specific mind body therapies is not supported by research,<sup>29</sup> or simply due to lack of knowledge about mind body therapies. Providers may also remain unconvinced of efficacy because the physiological mechanisms of mind body therapies for pain relief remain elusive. Many of the patient-related reasons for lack of use of these therapies also apply to providers. Finally, institutions may find it cost-prohibitive to offer mind body medical services at affordable rates, as most mind body medical therapies are not reimbursed by insurance.<sup>30</sup>

Our study has several limitations, the most important being that the 1999 NHIS was only designed to determine the rates of use of CAM therapies for health conditions but did not specify the conditions prompting use. Thus, it is not possible to know from this analysis what percentage of respondents with musculoskeletal pain who used mind body medicine or prayer did so specifically to treat their pain. Furthermore, our analysis was limited by small sample size in several of the specific health conditions studied. Because of the survey design, information on prolonged pain was limited to those with musculoskeletal pain of the appendicular skeleton, and did not include other common types of pain such as headache, abdominal pain, or back pain. In addition, because the NHIS did not have specific data on chronic pain, we used pain of at least one month's duration as a proxy. However, this limitation is somewhat attenuated by the fact that the prevalence of pain of at least one month's duration (20%) in the NHIS is similar to that reported in other nationally representative surveys of persistent and chronic pain.<sup>1,2</sup> It should also be noted that while specific NIH recommendations have focused on the use of mind body medicine for chronic pain, more recent research has demonstrated techniques such as guided imagery and relaxation to be beneficial in the setting of acute pain as well.<sup>31,32</sup>

To the extent that mind body medical therapies are useful in treatment of pain and have additional effects on patient-centered outcomes, they may represent attractive adjunctive treatments for integration into the expensive and technology-driven medical care systems of first-world countries. Future research should continue to investigate the efficacy of mind body therapies for specific conditions, investigate the role of co-morbid conditions in their use, and determine the combined effect of mind body therapies with traditional medical treatments. For example, rheumatology patients in particular may be excellent candidates for adjunctive care with mind body therapies because use of these therapies is not precluded by advanced age, severity of illness, or medication regimen. Effective pain control may best be achieved by combining traditional medical treatment interventions with mind body therapies. Our data suggest that mind body therapies may be underutilized, and further

research should examine the use and effectiveness of mind body therapies for specific medical conditions as well as address barriers to use of mind body therapies at the patient, provider, and institutional level.

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**Table 1**Frequency of joint involvement among respondents with musculoskeletal pain ( $N = 6079$ ).<sup>a</sup>

Joint affected	Percent of respondents with musculoskeletal pain
Two or more joints	72
Knees	45
Shoulders	26
Fingers/thumbs	25
Ankles	21
Hips	20
Wrists	19
Elbows	15
Other joints	13
Toes	10

<sup>a</sup>Percentages total >100% due to multiple joint involvement. Results are weighted to reflect national estimates.

**Table 2**Characteristics of respondents with and without prolonged musculoskeletal pain ( $n = 30,801$ ).<sup>a,b</sup>

	Musculoskeletal pain ( $n = 6079$ ), % (S.E.)	No musculoskeletal pain ( $n = 24722$ ), % (S.E.)	<i>p</i> -value
Sociodemographic factors			
Age			
<30	8.3 (0.49)	25.4 (0.41)	<.0001
30–39	13.9 (0.54)	22.7 (0.31)	
40–49	21.8 (0.59)	20.5 (0.31)	
50–64	27.6 (0.63)	17.9 (0.29)	
65+	28.4 (0.67)	13.5 (0.27)	
Race			
White	81.3 (0.61)	73.1 (0.43)	<.0001
Black	9.0 (0.43)	11.8 (0.32)	
Hispanic	7.0 (0.35)	11.0 (0.30)	
Other	2.8 (0.30)	4.1 (0.19)	
Gender			
Male	42.2 (0.72)	49.2 (0.37)	<.0001
Education			
<High school	8.8 (0.44)	6.0 (0.17)	<.0001
Completed high school	44.4 (0.72)	41.1 (0.47)	
Beyond high school	46.8 (0.77)	53.0 (0.51)	
Region			
Northeast	17.9 (0.68)	19.9 (0.42)	.0166
Midwest	27.0 (0.75)	25.3 (0.49)	
South	35.6 (0.87)	36.2 (0.50)	
West	19.6 (0.62)	18.6 (0.38)	
Birthplace			
United States born	91.9 (0.37)	86.2 (0.30)	<.0001
Health conditions/behaviors			
Peptic ulcer disease			
Yes	17.3 (0.55)	6.4 (0.18)	<.0001
Cancer			
Yes	11.4 (0.47)	5.4 (0.17)	<.0001
Depression			
Yes	26.5 (0.69)	11.9 (0.25)	<.0001
Physical activity			
Active	18.0 (0.62)	24.8 (0.37)	<.0001
Use of prayer and mind body medicine			
Prayer	19.7 (0.70)	12.1 (0.29)	<.0001
Mind body medicine			
Relaxation	9.2 (0.44)	4.9 (0.18)	<.0001
Imagery	8.0 (0.41)	4.2 (0.17)	<.0001
	2.7 (0.23)	1.5 (0.09)	<.0001

	Musculoskeletal pain ( <i>n</i> = 6079), % (S.E.)	No musculoskeletal pain ( <i>n</i> = 24722), % (S.E.)	<i>p</i> -value
Biofeedback	1.2 (0.15)	0.4 (0.04)	<.0001
Hypnosis	0.9 (0.14) <sup>c</sup>	0.4 (0.05)	.0025

<sup>a</sup> All results are weighted to reflect national estimates.

<sup>b</sup> Factors significant on bivariable analysis shown here.

<sup>c</sup> Estimate is based on a sample size <50 respondents and should be interpreted with caution, as it does not meet the standard of reliability or precision.

Table 3

Sociodemographic characteristics, health conditions, and health behaviors of respondents with musculoskeletal pain ( $n = 6079$ ) who used mind body medicine or prayer as compared to those who did not.<sup>a,b</sup>

	Mind body medicine (MBM)		Prayer		<i>p</i> -value
	MBM users ( <i>n</i> = 552), % (S.E.)	Non-MBM users ( <i>n</i> = 5527), % (S.E.)	Prayer users ( <i>n</i> = 1217), % (S.E.)	Non-Prayer users ( <i>n</i> = 4862), % (S.E.)	
Sociodemographic factors					
Age					
<30	10.7 (1.70)	8.1 (0.49)	7.5 (1.00)	8.5 (0.54)	.0001
30–39	19.3 (2.01)	13.4 (0.55)	14.4 (1.14)	13.8 (0.60)	
40–49	34.4 (2.32)	20.5 (0.63)	25.1 (1.40)	21.0 (0.66)	
50–64	27.9 (2.23)	27.6 (0.67)	30.7 (1.50)	26.8 (0.71)	
65+	7.7 (1.25)	30.5 (0.71)	22.3 (1.51)	29.9 (0.74)	
Gender					
Male	31.0 (2.24)	43.3 (0.77)	31.5 (1.61)	44.8 (0.79)	<.0001
Race					
White	86.6 (1.49)	80.7 (0.64)	80.2 (1.43)	81.6 (0.66)	.0013
Black	6.7 (1.14) <sup>c</sup>	9.2 (0.46)	11.8 (1.24)	8.3 (0.44)	
Hispanic	4.0 (0.49) <sup>c</sup>	7.3 (0.36)	4.9 (0.65)	7.5 (0.39)	
Other	2.8 (0.80) <sup>c</sup>	2.8 (0.80)	3.1 (0.73) <sup>c</sup>	2.7 (0.33)	
Education					
<High school	1.1 (0.37) <sup>c</sup>	9.6 (0.48)	7.1 (0.88)	9.3 (0.50)	<.0001
Any high school	24.1 (2.07)	46.4 (0.77)	37.7 (1.63)	46.0 (0.77)	
Beyond high school	74.8 (2.08)	44.0 (0.82)	55.2 (1.71)	44.8 (0.82)	
Region					
NE	17.8 (2.07)	17.9 (0.68)	11.6 (1.35)	19.4 (0.72)	<.0001
MW	25.8 (2.37)	27.1 (0.78)	28.8 (2.07)	26.5 (0.73)	
S	26.8 (2.13)	36.5 (0.90)	38.1 (2.03)	34.9 (0.90)	
W	29.6 (2.30)	18.6 (0.63)	21.5 (1.56)	19.2 (0.66)	
Marital status					

	Mind body medicine (MBM)			Prayer		
	MBM users (n = 552), % (S.E.)	Non-MBM users (n = 5527), % (S.E.)	p-value	Prayer users (n = 1217), % (S.E.)	Non-Prayer users (n = 4862), % (S.E.)	p-value
Married	54.7 (2.54)	59.8 (0.82)	.0492	60.9 (1.76)	59.0 (0.83)	.3135
Birthplace						
U.S. born	94.4 (1.10)	91.6 (0.39)	<b>.0191</b>	95.2 (0.66)	91.1 (0.43)	<b>&lt;.0001</b>
Insurance status						
Insured	89.2 (1.56)	89.2 (0.51)	.9749	89.0 (1.10)	89.3 (0.53)	.7833
Income						
<20k	18.5 (1.74)	28.7 (0.79)	<b>&lt;.0001</b>	28.1 (1.50)	27.7 (0.82)	<b>.0029</b>
20k to <55k	37.8 (2.36)	34.2 (0.79)		38.7 (1.70)	33.5 (0.83)	
55 to <75k	13.0 (1.57)	10.6 (0.54)		9.8 (1.11)	11.1 (0.55)	
75k+	23.2 (2.25)	14.5 (0.65)		15.1 (1.38)	15.4 (0.70)	
Health conditions						
Coronary artery disease						
Yes	8.7 (1.32)	11.5 (0.47)	<b>.0426</b>	14.1 (1.31)	10.6 (0.50)	<b>.0192</b>
Hypertension						
Yes	28.6 (2.36)	38.5 (0.72)	<b>.0001</b>	38.3 (1.54)	37.4 (0.78)	.6383
Diabetes						
Yes	7.5 (1.29) <sup>c</sup>	10.8 (0.47)	<b>.0170</b>	11.7 (1.04)	10.2 (0.50)	.2114
Asthma						
Yes	20.3 (1.86)	12.7 (0.55)	<b>.0002</b>	17.7 (1.34)	12.3 (0.55)	<b>.0002</b>
Peptic ulcer disease						
Yes	19.3 (1.81)	17.1 (0.58)	.2565	22.9 (1.44)	15.9 (0.61)	<b>&lt;.0001</b>
Cancer						
Yes	9.2 (1.26)	11.6 (0.48)	.0656	14.3 (1.22)	10.7 (0.48)	<b>.0052</b>
Inflammatory bowel disease						
Yes	2.5 (0.65) <sup>c</sup>	1.7 (0.20)	.2365	2.4 (0.49) <sup>c</sup>	1.6 (0.20)	.1442
Depression						
Yes	42.1 (2.41)	24.9 (0.70)	<b>&lt;.0001</b>	36.0 (1.60)	24.2 (0.72)	<b>&lt;.0001</b>
Anxiety						

	Mind body medicine (MBM)		Prayer		<i>p</i> -value
	MBM users ( <i>n</i> = 552), % (S.E.)	Non-MBM users ( <i>n</i> = 5527), % (S.E.)	Prayer users ( <i>n</i> = 1217), % (S.E.)	Non-Prayer users ( <i>n</i> = 4862), % (S.E.)	
Yes	10.2 (1.36)	7.3 (0.42)	9.2 (0.92)	7.2 (0.44)	<b>.0467</b>
Health status					
Excellent	16.7 (1.76)	15.4 (0.61)	15.2 (1.23)	15.6 (0.63)	.0922
Very Good	26.8 (1.99)	25.5 (0.71)	22.9 (1.37)	26.3 (0.79)	
Good	30.1 (2.37)	32.5 (0.71)	32.5 (1.56)	32.2 (0.76)	
Fair	17.1 (1.84)	18.2 (0.56)	19.0 (1.28)	17.9 (0.61)	
Poor	9.3 (1.31)	8.4 (0.41)	10.4 (0.98)	8.0 (0.44)	
Health behaviors					
Physical activity					
Active	24.7 (1.95)	17.4 (0.64)	20.5 (1.41)	17.4 (0.65)	<b>.0348</b>
Alcohol use					
Non-drinker	28.3 (2.09)	43.2 (0.85)	47.7 (1.63)	40.4 (0.87)	<b>&lt;.0001</b>
Consume <5 days/week	64.8 (2.33)	49.5 (0.81)	47.3 (1.62)	51.8 (0.84)	
Consume 5 days/week	6.9 (1.16) <sup>c</sup>	7.3 (0.41)	5.0 (0.76)	7.9 (0.43)	
Smoking status					
Current smoker	28.7 (2.07)	23.2 (0.65)	23.4 (1.45)	23.8 (0.71)	<b>.8401</b>

<sup>a</sup> All results are weighted to reflect national estimates.

<sup>b</sup> Statistically significant values shown in bold typeface.

<sup>c</sup> Estimate is based on a sample size <50 respondents and should be interpreted with caution, as it does not meet the standard of reliability or precision.

**Table 4**Multivariable analysis of factors independently associated with use of mind body medicine (MBM).<sup>a,b,c</sup>

	Use of MBM among those with characteristic, % (S.E.)	Adjusted odds ratio (95% CI), % (S.E.)
Sociodemographic factors		
Age		
<30	<b>11.9 (1.87)<sup>d</sup></b>	<b>2.91 (1.82–4.65)</b>
30–39	<b>12.8 (1.35)</b>	<b>3.39 (2.15–5.32) 3.39</b>
40–49	<b>14.6 (1.13)</b>	<b>3.79 (2.47–5.83)</b>
50–64	9.3 (0.85)	<b>2.79 (1.87–4.16)</b>
65+	2.5 (0.41)	1.0
Race		
Non-Hispanic White	9.8 (0.51)	1.0
Non-Hispanic Black	6.9 (1.19) <sup>d</sup>	0.71 (0.47–1.09)
Hispanic	<b>5.3 (0.97)<sup>d</sup></b>	<b>0.48 (0.29–0.80)</b>
Other	9.1 (2.38) <sup>d</sup>	0.94 (0.51–1.74)
Gender		
Male	<b>6.8 (0.61)</b>	<b>0.55 (0.43–0.71)</b>
Education		
<High school	<b>1.2 (0.39)<sup>d</sup></b>	<b>0.10 (0.04–0.24)</b>
Completed high school	<b>5.1 (0.50)</b>	<b>0.36 (0.28–0.47)</b>
Beyond high school	14.9 (0.79)	1.0
Region		
Northeast	9.2 (1.07)	1.28 (0.90–1.82)
Midwest	8.8 (0.91)	1.13 (0.83–1.52)
South	7.0 (0.58)	1.0
West	<b>13.9 (1.19)</b>	<b>1.65 (1.25–2.17)</b>
Birthplace		
United States born	<b>9.5 (0.47)</b>	<b>1.09 (0.63–1.87)</b>
Income		
<20k	6.3 (0.59)	1.0
20k to <55k	10.3 (0.78)	1.25 (0.95–1.66)
55 to <75k	11.4 (1.45)	1.25 (0.84–1.86)
75k+	14.3 (1.50)	1.46 (0.96–2.20)
Marital status		
Married	<b>8.5 (0.58)</b>	<b>0.70 (0.54–0.89)</b>
Health conditions/behaviors		
Asthma	<b>14.0 (1.40)</b>	<b>1.42 (1.08–1.87)</b>
Depression	<b>14.7 (1.01)</b>	<b>1.97 (1.56–2.51)</b>
Alcohol use		
Non-drinker	6.3 (0.53)	1.0
Consume <5 days/week	<b>11.8 (0.72)</b>	<b>1.33 (1.02–1.72)</b>

	<b>Use of MBM among those with characteristic, % (S.E.)</b>	<b>Adjusted odds ratio (95% CI), % (S.E.)</b>
Consume 5 days/week	8.8 (1.49) <sup>d</sup>	1.17 (0.74–1.86)

<sup>a</sup> Factors significant at a level of  $p < .05$  are shown in bold type.

<sup>b</sup> Table includes all variables adjusted for in the multivariable model.

<sup>c</sup> All results are weighted to reflect national estimates.

<sup>d</sup> Estimate is based on an a sample size <50 respondents and should be interpreted with caution, as it does not meet the standard of reliability or precision.



**Table 5**Multivariable analysis of factors independently associated with use of prayer<sup>a,b</sup>

	Use of prayer among those with characteristic, % (S.E.)	Adjusted odds ratio (95% CI)
Sociodemographic factors		
Age		
<30	17.8 (2.27)	1.18 (0.81–1.70)
30–39	<b>20.4 (1.61)</b>	<b>1.46 (1.09–1.96)</b>
40–49	<b>22.8 (1.37)</b>	<b>1.65 (1.25–2.17)</b>
50–64	<b>22.0 (1.18)</b>	<b>1.53 (1.20–1.94)</b>
65+	15.5 (1.13)	1.0
Race		
Non-Hispanic White	19.5 (0.76)	1.0
Non-Hispanic Black	<b>26.0 (2.41)</b>	<b>1.34 (1.02–1.77)</b>
Hispanic	14.0 (1.66)	0.83 (0.58–1.17)
Other	21.9 (4.73) <sup>c</sup>	1.39 (0.78–2.50)
Gender		
Male	<b>14.8 (0.92)</b>	<b>0.56 (0.48–0.66)</b>
Education		
<High school	<b>15.9 (1.89)</b>	<b>0.57 (0.42–0.79)</b>
Completed high school	<b>16.7 (0.90)</b>	<b>0.61 (0.52–0.71)</b>
Beyond high school	23.2 (0.96)	1.0
Region		
Northeast	<b>12.8 (1.36)</b>	<b>0.64 (0.48–0.84)</b>
Midwest	21.1 (1.52)	1.08 (0.85–1.36)
South	21.2 (1.17)	1.0
West	21.6 (1.48)	1.10 (0.88–1.38)
Birthplace		
United States born	<b>20.5 (0.75)</b>	<b>1.81 (1.21–2.70)</b>
Income		
<20k	20.2 (1.06)	1.0
20k to <55k	22.3 (1.07)	1.06 (0.89–1.27)
55 to <75k	18.1 (2.01)	0.83 (0.62–1.13)
75k+	19.6 (1.80)	0.90 (0.68–1.19)
Health conditions/behaviors		
Asthma	26.1 (1.80)	1.19 (0.95–1.50)
Depression	<b>26.8 (1.32)</b>	<b>1.46 (1.23–1.75)</b>
Coronary artery disease	<b>24.7 (2.24)</b>	<b>1.57 (1.19–2.08)</b>
Cancer	<b>24.8 (1.96)</b>	<b>1.41 (1.12–1.78)</b>
Peptic ulcer disease	<b>26.2 (1.77)</b>	<b>1.39 (1.13–1.71)</b>
Physical activity		
Active	<b>22.5 (1.46)</b>	<b>1.35 (1.12–1.64)</b>
Use of alcohol		

	Use of prayer among those with characteristic, % (S.E.)	Adjusted odds ratio (95% CI)
Non-drinker	22.8 (1.02)	1.0
Consume <5 days/week	<b>18.5 (0.85)</b>	<b>1.33 (1.02–1.72)</b>
Consume ≥ 5 days/week	13.6 (1.98)	1.17 (0.74–1.86)

<sup>a</sup> Factors significant at a level of  $p < .05$  are shown in bold type.

<sup>b</sup> Table includes all variables adjusted for in the multivariable model.

<sup>c</sup> Estimate is based on a sample size <50 respondents and should be interpreted with caution, as it does not meet the standard of reliability or precision.