When Conventional Medical Providers Recommend Unconventional Medicine: Results of a National Study

In 2007, 38% of Americans used complementary and alternative medicine (CAM).[1] Rates of CAM use have increased since 2002, with mind-body therapies (MBT) composing 75% of this rise.[1] Evidence to support the therapeutic use of MBT (including yoga, tai chi, qi gong, meditation, guided imagery, progressive muscle relaxation, and deep-breathing exercises)[2] is growing.[3] Little is known about the use of MBT by patients as a result of conventional medical provider recommendation. Our study objective was to compare patients using MBT as a result of conventional medical provider referral with those who self-referred for MBT.

Methods. We obtained data from the 2007 National Health Interview Survey (NHIS),[4] which uses a cross-sectional, multistage, stratified sampling design to question randomly selected households within the United States. The final sample included 23 393 respondents (response rate, 67.8%).[4] We were interested in respondents who had used MBT (n=4296) who were asked "In the past 12 months, did you use [an MBT] because it was recommended by a health care provider?" Respondents answering "yes" were classified as provider-referred mind-body therapy (P-MBT) users and those answering "no" were classified as self-referred mind-body therapy (S-MBT) users.

To account for the complex sampling scheme used by NHIS, we conducted weighted analyses using SAS-callable SUDAAN (version 10.0; SAS Institute Inc, Cary, North Carolina). Potential correlates of P-MBT use were (1) sociodemographic characteristics (age, sex, race, education, income, region, marital status, and insurance status), (2) health status (current health, comparison with prior year, number of days in bed because of illness, and the Charlson Comorbidity Index), (3) pre-existing medical conditions (using the 16 most prevalent comorbidities in the United States), (4) health behaviors (smoking, alcohol use, exercise, and body mass index), and (5)

Table. Factors Independently Associated With the Use of P-MBT[a]

Factor	Past 12 Months (Weighted, %) P-MBT Users (n = 668)	Past 12 Months (Weighted, %) S-MBT Users (n = 3628)	Adjusted Multivariable Logistic Regression Results, OR (95% CI)	*P* Value
Health behaviors				
Alcohol use				
Abstainer	13.5	12.7	1 [Reference]	
Rare/light	46.8	50.5	0.79 (0.57-1.11)	
Moderate	14.3	16.2	0.92 (0.68-1.38)	.01
Heavy	3.6	6.9	0.46 (0.25-0.83)	
Former	21.5	12.5	1.06 (0.73-1.53)	
Health status			d	
Charlson Comorbidity Index				
0	35	57.5	1 [Reference]	
1	29.7	24.4	1.51 (1.17-1.95)	
2	15.6	9.7	1.72 (1.22-2.43)	.001
3	8.4	5.1	1.55 (1.03-2.34)	
≥4	11.3	3.3	2.57 (1.69-3.91)	
Health care utilization				
Total No. of office visits, past 12 mo				
None	3.7	15.4	1 [Reference]	
1	6.9	15.2	1.95 (1.12-3.41)	
2-3	19.2	28.1	2.67 (1.62-4.41)	.001
4-7	27.1	22.0	3.82 (2.38-6.14)	
≥8	42.8	19.1	5.14 (3.25-8.12)	
Encounter with mental health professional, past 12 mo				
Yes	34.6	11.5	2.57 (1.99-3.31)	.001
No	65.4	88.4	1 [Reference]	
Medical conditions				
COPD/emphysema				
Yes	6.4	1.2	3.06 (1.76-5.31)	.001
No	93.6	98.8	1 [Reference]	
Anxiety				
Yes	37.6	16.2	1.87 (1.47-2.38)	.001
No	62.4	83.8	1 [Reference]	

Abbreviations: CI, confidence interval; COPD, chronic obstructive pulmonary disease; OR, odds ratio; P-MBT, provider-referred mind-body therapy; S-MBT, self-referred mind-body therapy.

[a] Data Source: Centers for Disease Control and Prevention/National Center for Health Statistics, National Health Interview Survey, 2007.[4]

health care utilization (office visits in the past year, emergency department visits in the past year, and encounters with general physicians, medical specialists, and mental health professionals). Multivariable logistic regression modeling identified those factors independently associated with P-MBT use.

Results. Nearly 1 in 30 Americans (2.9% of respondents), representing 6.36 million Americans, reported using P-MBT (n=668) compared with 15.5% of respondents, representing 34.8 million Americans, who reported using S-MBT (n=3628) in the past 12 months. The mean age of P-MBT users was 46.8 years compared with 43.4 years among S-MBT users. Deep-breathing exercises were the most common P-MBT used (84.4%), followed by meditation (49.3%), yoga (22.6%), progressive muscle relaxation (19.9%), and guided imagery (13.9%); similar trends were seen in the S-MBT group. The total percentage exceeded 100% because more than 1 MBT modality was used by some respondents.

Our adjusted multivariable analyses identified factors independently associated with P-MBT use (**Table**). No sociodemographic characteristics were independently associated with P-MBT use. Of our health status markers, higher Charlson scores were associated with a greater likelihood of P-MBT use. Respondents with more chronic conditions, quantified by a Charlson score of 4 or higher and composing 11.3% of all P-MBT users, were more likely to use P-MBT. Of our 16 comorbid conditions, only chronic obstructive pulmonary disease and anxiety were associated with P-MBT use. Greater health care use was associated with a greater use of P-MBT. We observed a "dose-response" relationship with the number of office visits and the use of P-MBT: as the number of office visits increased over a 12-month period, so did the likelihood of using P-MBT. Use of P-MBT was associated with an encounter with a mental health professional over the past 12 months. Finally, respondents with heavy alcohol use were less likely to use P-MBT.

Comment. To our knowledge, our study is the first to examine patient factors associated with the use of MBT as a result of conventional medical provider referral. We found that individuals who used P-MBT tended to have a greater illness burden and use the health care system more than their counterparts who self-referred for MBT. This is consistent with prior literature showing that increasing comorbidities correspond to greater rates of overall CAM use,[5] and CAM users are high users of conventional health care services.[5,6] Our data suggest that conventional health care providers treating sicker patients with more frequent office visits may offer referrals for MBT as a last resort once conventional therapeutic options have been exhausted or have failed.

Both anxiety and visits to a mental health professional in the past year was associated with P-MBT use. Recent data suggest that the majority of patients who have seen a psychiatrist for treatment of anxiety or depression have also used CAM,[7] and the association between MBT use and anxiety is well documented.[2,8]

Although MBT shows promise in the treatment of substance abuse,[9] heavy alcohol users compose the smallest proportion of MBT users overall.[2] Possibly, physicians refer patients who drink heavily to MBT, but a variety of barriers prevent their use of P-MBT.

Whether MBT referrals could result in improved patient outcomes or decreased health care use if offered earlier in the course of illness remains to be seen. Physicians' referrals for MBT may inform recommendations for use, highlight areas of underuse or overuse, or may suggest areas for future research and intervention.

Aditi Nerurkar, MD, MPH
Gloria Yeh, MD, MPH
Roger B. Davis, ScD
Gurjeet Birdee, MD, MPH
Russell S. Phillips, MD

Author Affiliations: Division for Research and Education in Complementary and Integrative Medical Therapies, Harvard Medical School, and Division of General Medicine and Primary Care, Department of Medicine, Beth Israel Deaconess Medical Center, Boston, Massachusetts (Drs Nerurkar, Yeh, Davis, and Phillips); and Division of General Internal Medicine and Public Health, Vanderbilt University, Nashville, Tennessee (Dr Birdee).
Correspondence: Dr Nerurkar, Osher Research Center, Harvard Medical School, 77 Avenue Louis Pasteur, Ste 1030, Boston, MA 02115 (Aditi_Nerurkar@hms.harvard.edu).
Author Contributions: *Study concept and design:* Nerurkar, Yeh, Birdee, and Phillips. *Acquisition of data:* Nerurkar. *Analysis and interpretation of data:* Nerurkar, Yeh, Davis, Birdee, and Phillips. *Drafting of the manuscript:* Nerurkar, Birdee, and Phillips. *Critical revision of the manuscript for important intellectual content:* Nerurkar, Yeh, Davis, Birdee, and Phillips. *Statistical analysis:* Nerurkar, Davis, Birdee, and Phillips. *Obtained funding:* Phillips. *Administrative, technical, and material support:* Phillips. *Study supervision:* Yeh and Phillips.
Financial Disclosure: None reported.
Funding/Support: Dr Nerurkar is supported by an Institutional National Research Service Award (T32AT000051-11) from the National Institutes of Health. Dr Phillips and Davis are supported by a Mid-Career Investigator Award (K24-AT000589) from the National Center for Complementary and Alternative Medicine, National Institutes of Health.
Disclaimer: The analyses, interpretations, and conclusions are of the authors and do not reflect the views of the National Center for Health Statistics, the Centers for Disease Control and Prevention, the National Center for Complementary and Alternative Medicine, or the National Institutes of Health.
Previous Presentation: A portion of this study was presented at the annual meeting of the Society of General Internal Medicine; April 29, 2010; Minneapolis, Minnesota.

1. Barnes PM, Bloom B, Nahin RL. Complementary and alternative medicine use among adults and children: United States 2007. *Natl Health Stat Report*. 2008;(12):1-23.
2. Bertisch SM, Wee CC, Phillips RS, McCarthy EP. Alternative mind-body therapies used by adults with medical conditions. *J Psychosom Res*. 2009;66(6):511-519.

3. Astin JA, Shapiro SL, Eisenberg DM, Forys KL. Mind-body medicine: state of the science, implications for practice. *J Am Board Fam Pract*. 2003;16(2):131-147.
4. National Center for Health Statistics. *Data File Documentation, National Health Interview Survey, 2007* [machine readable data file and documentation]. Hyattsville, MD: National Center for Health Statistics, Centers for Disease Control and Prevention; 2008.
5. Kannan VD, Gaydos LM, Atherly AJ, Druss BG. Medical utilization among wellness consumers. *Med Care Res Rev*. 2010;67(6):722-736.
6. Wolsko PM, Eisenberg DM, Davis RB, Ettner SL, Phillips RS. Insurance coverage, medical conditions, and visits to alternative medicine providers: results of a national survey. *Arch Intern Med*. 2002;162(3):281-287.
7. Kessler RC, Soukup J, Davis RB, et al. The use of complementary and alternative therapies to treat anxiety and depression in the United States. *Am J Psychiatry*. 2001;158(2):289-294.
8. Saeed SA, Antonacci DJ, Bloch RM. Exercise, yoga, and meditation for depressive and anxiety disorders. *Am Fam Physician*. 2010;81(8):981-986.
9. Dakwar E, Levin FR. The emerging role of meditation in addressing psychiatric illness, with a focus on substance use disorders. *Harv Rev Psychiatry*. 2009; 17(4):254-267.

HEALTH CARE REFORM

Influence of Therapeutic Complexity on Medication Adherence in the Netherlands

In their study on the implications of therapeutic complexity on adherence to cardiovascular medications, Choudhry et al[1] describe predictors that are associated with poor adherence. They suggest that a number of these predictors could also be aimed at improving adherence, including reducing copayments, reducing the frequency with which prescriptions need to be filled, and creating a "pharmacy home" or a single pharmacy at which a patient refills his or her prescriptions.[1,2] In the Netherlands, virtually all of these recommendations are implemented. In the Dutch health care system, larger supplies with a maximum of 90 days may be prescribed; no copayment with long-term medication exists; virtually all patients use a single pharmacy; all prescription medication is captured by the database; and hardly any mail-order pharmacies are present.[3]

We investigated whether in the Dutch situation adherence would be better, and whether a similar association with therapeutic complexity as found by Choudhry et al[1] would be seen. From the PHARMO database we selected a sample of patients who initiated statin therapy between January 1 and December 31, 2004, and investigated whether therapeutic complexity predicted nonpersistence and poor drug-taking compliance after 12 months of follow-up.[4] A patient was considered nonpersistent if a continuous gap of 60 days or more was present, and a patient had poor compliance if the Continuous Measure of Medication Acquisition (CMA) was lower than 80%.[5] We used binary logistic regression to calculate the odds ratios for either nonpersistence or poor compliance. We investigated the following variables, calculated in the year previous to new statin use: (1) number of pharmacy visits, (2) number of medications filled, (3)

See also page 814

number of long-term medication classes, (4) number of single medication dispensings (ie, single pharmacy pickups like an antibiotic course), (5) refill consolidation, (6) number of dose changes within each drug class, (7) number of prescribing physicians, and (8) number of switches within each drug class (eg, enalapril to ramipril). We included 6614 new statin users and identified 4189 statin users (63%) with a 60-day continuous gap during follow-up. Of the remaining 2425 continuous statin users, 111 (5%) had a CMA lower than 80%. The odds ratios and mean values for each investigated variable are presented in the **Table** for both persistence and compliance.

We observed a statistical significant correlation between therapeutic complexity and nonpersistence for the number of visits, number of fills, number of single dispensings, number of prescribing physicians, and total number of switches within each drug class. However, odds ratios approached 1, indicating a low predictive value. For compliance, only the number of single dispensings

Table. The Association Between Therapeutic Complexity and Adherence to Statin Therapy

Variable[a]	Persistent vs Nonpersistent, OR (95% CI)	Mean (SD)		Good vs Poor Drug-Taking Compliance, OR (95% CI)	Mean (SD)	
		Persistent (n = 2425)	Nonpersistent (n = 4189)		Good Drug-Taking Compliance (n = 2314)	Poor Drug-Taking Compliance (n = 111)
No. of visits	1.010 (1.004-1.015)	14 (10)	15 (9)	1.004 (0.985-1.023)	14 (9)	14 (14)
No. of fills	1.003 (1.001-1.005)	25 (24)	27 (22)	1.001 (0.994-1.009)	25 (22)	26 (46)
No. of long-term medication classes	1.020 (1.000-1.041)	4 (3)	4 (3)	0.972 (0.895-1.055)	4 (3)	4 (3)
No. of single dispensings	1.035 (1.011-1.060)	3 (2)	3 (2)	1.088 (1.005-1.178)	3 (2)	4 (3)
Refill, consolidation	1.228 (0.985-1.537)	0.36 (0.20)	0.37 (0.20)	0.631 (0.250-1.595)	0.36 (0.21)	0.34 (0.19)
No. of dose changes within drug class	1.015 (0.999-1.032)	2 (3)	2 (3)	1.032 (0.998-1.067)	2 (3)	2 (9)
No. of prescribing physicians	1.092 (1.040-1.146)	2 (1)	2 (1)	1.019 (0.848-1.224)	2 (1)	2 (1)
Total No. of switches within each drug class	1.020 (1.011-1.030)	8 (6)	9 (6)	1.022 (0.999-1.046)	8 (6)	9 (12)

Abbreviations: CI, confidence interval; OR, odds ratio.
[a]Calculated 12 months before statin initiation.