Original Articles

Effects of Complementary Therapy on Health in a National U.S. Sample of Older Adults

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Abstract

Objectives: The study objectives were to identify types of complementary therapy that are most predictive of health outcomes, including functional status, physical health–related quality of life (HRQoL), and mental HRQoL among older adults.

Design: This was a prospective study.

Settings/location: The study comprised computer-assisted interviews conducted in participants' homes.

Subjects: Subjects included 1683 adults aged 55 and older who participated in the 2002 National Health Interview Survey and the 2003 Medical Expenditure Panel Survey.

Intervention: None.

Outcome measures: Functional status, physical HRQoL, and mental HRQoL at 1-year follow-up.

Results: The use of biologically based therapies predicted better functional status, such that users reported less functional impairment than nonusers ($p < 0.01$), adjusting for age, gender, race/ethnicity, education, health insurance, household income, and comorbid conditions. Users of manipulative and body-based methods reported less functional impairment ($p < 0.05$). They also reported better physical and mental health–related quality of life, though these relationships were marginally significant. Other groups of therapies, alternative medical systems, mind–body therapies, and prayer were not predictive of either functional status or HRQoL.

Conclusions: Favorable effects were observed among users of biologically based therapies and users of manipulative and body-based methods. Other types of complementary therapy had no effects on health status over a 1-year follow-up period.

Introduction

MANY OLDER ADULTS include complementary therapies in their health self-management. Arcury et al.[1] indicate that 27.7% of older adults use a complementary therapy not including prayer. Much higher rates of complementary use are reported in an analysis of the Health and Retirement Study (88%),[2] and based on a survey of community-dwelling older adults in Minnesota (67%).[3] Both of the latter studies include prayer as a complementary therapy. Correlates of complementary use in older adults include Hispanic and Asian ethnicity, higher levels of education, larger number of health conditions, and older adults who live in the West.[1] Williamson et al.[4] report that 40.5% of older adults interviewed used complementary therapies to improve quality of life, while 54.8% used complementary therapies for pain relief. Although understanding of how and why older adults include complementary therapies in their health self-management regimens is expanding,[1–3,5–7] studies reported to date have not determined the putative effects of complementary use on health in a national U.S. sample of older adults.

Complementary therapies include a substantial range of materials and practices. The National Center for Complementary and Alternative Medicine (NCCAM) recognizes six distinct types of complementary therapies: alternative medical systems, biologically based therapies, manipulative and body-based practices, mind–body therapies, energy medicine, and self-prayer. Barnes et al.[7] showed that the majority of older adults include prayer for health within their health behaviors. Many older adults use biologically based complementary therapies (15.6%), particularly herbs and supplements, and mind–body therapies (e.g., biofeedback and meditation) (11.7%).[1] Some older adults use manipulative therapies (7.6%), such as chiropractic and massage;

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however, few older adults use alternative medical systems (e.g., acupuncture and Ayurveda) (1.4%) or energy-based therapies such as *qigong* and Reiki (0.3%).

Prior studies examining the effects of complementary therapy use on health among older adults have been limited by cross-sectional data or nonrepresentative samples. For example, previous national studies generally conclude that poor health or poor health-related quality of life (HRQoL) motivates the use of complementary therapy.[1,2,6,7] The possibility that complementary therapy use impacts health status has not been explored due to the lack of longitudinal data. Likewise, published longitudinal studies have weaknesses resulting from small and nonrepresentative samples. Previous research also has not examined the differential effects of complementary therapy on different health outcomes. Given the multitude of therapies used by older adults, it is important to delineate complementary therapies that affect different domains of health such as functional status and HRQoL. The objectives of this study are (1) to examine the short-term (1 year) association of complementary therapy with three domains of health: functional status, physical HRQoL, and mental HRQoL; and (2) to determine the domains of health that are more sensitive than others to different types of complementary therapies. Accomplishing these objectives is significant because it is the first longitudinal assessment of possible differences in health outcome by use of complementary therapies in a national U.S. sample of older adults.

Materials and Methods

Sample

Data for this study came from the 2002 National Health Interview Survey (NHIS) with Alternative Health Supplement, and the 2003 Medical Expenditure Panel Survey (MEPS). Both data files are representative, population-based surveys of the civilian, noninstitutionalized U.S. population. These data are obtained through face-to-face interviews. The MEPS samples individuals from NHIS participants.

The sampling plan for the 2002 NHIS followed a multistage area probability design. The final survey included approximately 106,000 persons from 43,000 households. The household response rate for the 2002 survey was 89.6%. The survey included three components in the basic module: the Family Core, the Sample Adult Core, and the Sample Child Core. All adult members of a household were invited to complete the Family Core component, while a randomly selected (if more than one) adult family member was selected to complete the Sample Adult Core. In the 2002 NHIS, respondents for the Sample Adult Core also completed the Alternative Health supplement. The data for this analysis were drawn from participant responses to questions in the Family Core, the Sample Adult Core, and the Alternative Health Supplement.

The 2003 MEPS sample was drawn from a subsample of households from the 2002 NHIS. The MEPS survey included two major components: the Household Component (MEPS-HC) and the Medical Provider Component (MEPS-MPC). This analysis used measures coming only from the MEPS-HC component. We included participants from PANEL 8 (i.e., data collected in 2003), which was a subsample of the 2002 NHIS respondents who completed the Adult Sample

Core component. From the 2003 MEPS-2002 NHIS Link Data, 1683 adults aged 55 and over had responses to questions in the NHIS Family Core, the Sample Adult Core, and the Alternative Health Supplement and therefore were included in this analysis. Details about the methodology of the MEPS-Linked to the NHIS are available online (http://meps.ahrq.gov/mepsweb/).

Domains of health outcome

Measures of health outcomes were functional status, physical HRQoL, and mental HRQoL. Data for the three health outcomes came from the 2003 MEPS-HC. Functional status was assessed using six lower-body strength items from the established Nagi self-report measure.[8] The items were asked in the framework of health or physical problems affecting lower-body strength (e.g., climbing 10 steps, walking 3 blocks, walking a mile, standing 20 minutes, and bending or stooping). Response options were 1 = no difficulty, 2 = some difficulty, 3 = a lot of difficulty, 4 = unable to do, and 5 = completely unable to. The items were coded and added up (Cronbach's $\alpha = 0.87$) to create functional status score, with higher scores indicating greater functional limitations. The scale is widely used and is sensitive to high levels of physical functioning.[9–11]

The MEPS includes the 12-item short form of the Medical Outcomes Study questionnaire (SF-12v2) to assess HRQoL. The SF-12 demonstrates strong validity[12,13] and has been used extensively in studies of health outcomes.[14,15] The instrument measures eight health concepts over the past week representing discrete aspects of a person's functioning most likely to be affected by disease and treatment. The eight health concepts include physical functioning (limitations doing moderate activities, and limitations in climbing several flights of stairs), physical role limitations (less accomplishment than one would like to achieve, and limitation in kind of work or other activities), emotional role limitations (less accomplishment than one would like to achieve, and not being careful in doing activities as usual), pain (pain interference with one's normal work), general health (general health perception), vitality (having energy), social functioning (physical and mental health interfere with one's social activities), and mental health (feeling calm or peaceful, and feeling sad or blue). Published scoring procedures were used to arrive at two composite summary indicators of physical HRQoL and mental HRQoL.[13] A higher score on each scale indicates better HRQoL.

Complementary therapy use

The primary independent variables were any use of specific types of complementary therapies. The NHIS asked respondents if they used any of the 28 different unconventional modalities within the past year. Responses to these items were combined to create a dichotomous variable reflecting any use of five of the six complementary therapies recognized by the NCCAM, including alternative medical systems (i.e., any use of acupuncture, Ayurveda, homeopathy, or naturopathy in the past year), biologically based therapies (i.e., any use of chelation therapy, folk medicine, herb use, diet-based therapy, or megavitamin therapy in the past year), manipulative and body-based methods (i.e., any use of chiropractic and massage in the past year), mind–body

medicine (i.e., any use of biofeedback, relaxation techniques such as meditation, hypnosis, movement therapies such as yoga, or healing rituals in the past year), and self-prayer. NCCAM also recognizes energy therapies such as *qigong* and Reiki. However, like earlier reports,[1,7,16] we combined these modalities with mind–body medicine because questions about *qigong* could not be separated from those about yoga and *t'ai chi*, and we felt it was inappropriate to have Reiki solely represent a class of therapy.

Covariates

The NHIS includes data on demographic and sociodemographic characteristics. Respondents' ages were included as a continuous covariate. Race and ethnicity were operationalized categorically representing non-Hispanic white, non-Hispanic African American, non-Hispanic other, and Hispanic. Other covariates included gender, educational attainment (less than a high school degree, a high school degree or equivalent and some college or technical training, and a 4-year college degree or more), and health insurance (yes/no). Household income was measured by a dichotomy (<$20,000 and ≥$20,000 in the past year); this measure was chosen because it had the least missing data of any of the household income measures in the NHIS. Comorbid conditions were included as the total number of chronic health conditions (e.g., hypertension, stroke, diabetes, cancer, arthritis, and coronary heart disease).

Data analysis

The statistical analyses were performed using SUDAAN (Research Triangle Institute, Research Triangle Park, NC) to account for the complex survey design of NHIS and MEPS data. The MEPS survey sampling weights were incorporated in the analysis to produce population estimates. The SUB-POPN statement was used to restrict the analysis to adults aged 55 and older. Analyses examined use of several distinct types of complementary therapies, including use of alternative medical systems (AMS), use of biologically based therapies (BBT), use of manipulative and body-based methods (MBB), use of mind-body therapies (MBT), and use of prayer for health purposes. For each of the three outcomes (i.e., functional status, physical HRQoL, and mental HRQoL), separate linear regression models were fit using PROC RE-GRESS to examine the effects of using specific types of complementary therapies. These regression models included covariate adjustment for the effects of age, gender, race/ethnicity, education, health insurance, household income, and the number of comorbid conditions. For categorical independent variables such as any use of AMS, the b coefficient represents the difference in predicted scores between those with any use of AMS and those without any use of AMS. For continuous independent variables (e.g., age), the b coefficient represents the difference in predicted scores for every one unit difference (e.g., each additional year) in the independent variable.

Results

Table 1 shows sociodemographic variables and other covariates of the study population. Of the five types of complementary therapies, use of prayer for health was the most commonly reported form, used by 52.3% of the sample. Predictors of functional status, physical HRQoL, and mental HRQoL vary by type of complementary therapies (Table 2). The use of biologically based therapy predicted better functional status, such that users reported less functional impairment than nonusers ($p < 0.01$), adjusting for age, gender, race/ethnicity, education, health insurance, household income, and comorbid conditions. Similarly, relative to

TABLE 1. CHARACTERISTICS OF THE STUDY SAMPLE ($N = 1683$)

Variable	N (%)	Mean (SE) [range]
Age		68.5 (0.3) [55–85]
Female	1057 (59.5)	
Ethnicity		
Hispanic	203 (5.7)	
Non-Hispanic white	1229 (83.7)	
Non-Hispanic African American	217 (8.6)	
Non-Hispanic other	34 (2.0)	
Education		
<High school	536 (24.4)	
High school, some college	827 (52.5)	
College graduate	306 (23.1)	
No health insurance	84 (4.05)	
<$20,000 household income	655 (32.4)	
Comorbid conditions		3.8 (0.1) [0–20]
Any use of alternative medical systems	44 (2.5)	
Any use of biologically based therapies	344 (20.4)	
Any use of manipulative and body-based methods	151 (9.7)	
Any use of use of mind–body therapies	253 (16.2)	
Any use of prayer for health	948 (52.3)	
Functional status		14.5 (0.2) [6–25]
Physical health-related quality of life		43.5 (0.3) [8.3–73.9]
Mental health-related quality of life		51.4 (0.3) [1.4–75.1]

SE, standard error.

Table 2. Regression Models Describing Differences in Health Outcomes
in 2003 by Use of Complementary Therapies in 2002

	AMS β (SE)	BBT β (SE)	MBB β (SE)	MBT β (SE)	Prayer β (SE)
Physical HRQoL	2.63 (1.67)	0.55 (0.73)	1.65 (0.94)++	0.41 (0.88)	−0.12 (0.68)
Mental HRQoL	−0.60 (1.59)	−0.03 (0.65)	1.37 (0.71)+	1.07 (0.69)	0.36 (0.55)
Functional status	−1.54 (1.18)	−1.41 (0.53)**	−1.64 (0.81)*	0.01 (0.64)	−0.55 (0.49)

*$p < 0.05$, **$p < 0.01$, +$p = 0.06$, ++$p = 0.08$. Regression models adjusted for age, gender, race/ethnicity, education, health insurance, household income, and comorbid conditions.

AMS, alternative medical system; BBT, biologically based therapy; MBB, manipulative and body-based; MBT, mind–body therapy; SE, standard error; HRQoL, health-related quality of life; β, beta coefficient.

nonusers of manipulative and body-based methods (MBB), users of these complementary therapies had fewer functional limitations ($p < 0.05$). Users of manipulative and body-based methods (MBB) also reported better physical and mental health-related quality of life, though these relationships were marginally significant ($p = 0.08$ and $p = 0.06$, respectively).

In addition, covariates included in the regression models also predicted functional status, physical HRQoL, and mental HRQoL at 1-year follow-up. Increasing age was predictive of higher functional limitations and poorer physical HRQoL, but not predictive of mental HRQoL. The β coefficients of age for predicting functional status and physical HRQoL ranged from 0.06 to 0.07 ($p < 0.01$), and −0.21 to −0.23 ($p < 0.01$), respectively. Individuals with less than a high school degree were more likely to report poorer functional status (β coefficient range, 1.90–2.14, $p < 0.01$) and poorer physical HRQoL (β coefficient range, −3.98 to −4.11, $p < 0.01$) relative to adults with a college graduate degree. Older adults without health insurance had higher functional limitations (β coefficient range, 2.01–2.17, $p < 0.01$) compared with individuals with health insurance. Low income (<$20,000) was a predictor of poor physical HRQoL (β coefficient range, −1.61 to −1.78, $p < 0.05$) and poor mental HRQoL (β coefficient range, −1.76 to −1.88, $p < 0.05$). Increasing comorbid conditions were associated with higher functional limitations (β coefficient range, 0.28 to 0.29, $p < 0.001$) and poorer physical HRQoL (β coefficient range, −1.50 to −1.52, $p < 0.001$).

Discussion

This analysis verifies the levels of complementary therapy use among older adults that have been reported in other analyses.[1] Other research has evaluated specific complementary therapies; for example, *t'ai chi* has shown these therapies to be efficacious in relieving physical symptoms or improving HRQoL among older adults.[17,18] However, these evaluations of complementary therapies have had a small number of select participants. Other research evaluating specific complementary therapies in larger samples of older adults (e.g., *Gingko biloba* for memory) has not found these therapies to be efficacious.[19]

This is the first analysis using longitudinal data from a national probability sample to indicate that the use of biologically based therapies predicts better functional status. Evidence on the effectiveness of biologically based therapies is difficult to establish, mainly because many clinical studies of biologically based therapies have barriers such as small

sample size, poor design, lack of preliminary dosing data, or difficulty with defining outcomes. Nevertheless, our finding is consistent with previous studies that have yielded positive or at least encouraging data supporting the use of biologically based therapies (e.g., vitamins and minerals) and better functional status.[20,21]

This analysis also found that the use of manipulative and body-based therapies predicts better functional status, better physical HRQoL, and better mental-health related quality of life. Manipulative and body-based therapies include chiropractic and massage therapy. Our analysis provides new information on the association between the use of manipulative and body-based therapies and better physical and mental HRQoL over a 1-year follow-up period. This is an important finding that has not been reported in the literature before, perhaps because most studies have concentrated on measures of functional status or disability to determine the effectiveness of a manipulative and body-based therapy.[22–24] At the same time, we did not find other groups of therapies, alternative medical systems, mind–body therapies, and prayer to be predictive of either functional status or HRQoL. Our study highlights the importance of evaluating multiple outcome measures because different types of complementary therapy actually have specific effects or no effects.

This research has several limitations that should be considered in evaluating the results. Although the number of participants is relative large and they were selected as part of a nationally representative sample, the sample may have limited power to detect some associations given the large number of specific complementary therapies that older adults might use. Biologically based therapies and manipulative and body-based therapies are groups of therapies; we cannot know from these results the specific therapies that may be related to better functional status and HRQoL. In addition, this analysis reports short-term (1 year) effects. Our limited lengths of follow-up leave important questions unanswered about the effects of complementary therapy on long-term health. Interaction effects (e.g., gender by any use of AMS, and ethnicity by any use of MBB) were not included in our analysis, mainly due to low rates of complementary use including AMS, MBB, and MBT. Further stratified analyses (e.g., ethnicity by any use of AMS) would result in small cell sizes and might not have enough power to detect the differences observed across several subgroups. Consideration of interaction effects are possible avenues for future studies. Finally, the results should not be interpreted as evidence for effectiveness of complementary therapies. These findings confirm that randomized trials remain necessary to

evaluate the safety and effectiveness of complementary therapy in the health self-management of older adults.

Despite these limitations, the results suggest several important implications. First, older adults turn to complementary therapies because of their potential favorable effects on health. Our findings of the beneficial effects of complementary therapy, although not the same as proof of efficacy, suggest that potential efficacy may be a significant reason for using complementary therapy. These results are consistent with previous studies reporting belief in efficacy as a predictor of use.[6]

Second, we find selected types (e.g., manipulative and body-based therapies) of complementary therapy to be beneficial not only for functional status but also for physical and mental health-related quality of life. Functional status is necessary for independence, but HRQoL is a particularly important concept for evaluating the health of older adults. HRQoL has been shown to be highly associated with health service utilization and mortality in older adults.[25,26] The favorable effects of complementary therapy on HRQoL in a large, national U.S. sample of older adults have not been documented. Furthermore, because of cross-sectional data, previous research has shown an association of poor health or poor HRQoL with complementary therapy use, supporting the notion that poor HRQoL is established before complementary therapy use.[3,6,27,28] We recognize HRQoL as an important correlate of complementary therapy use. However, our longitudinal analysis is the first to support the impact of use on HRQoL.

Lastly, the results have an important clinical implication for health professionals who care for aging individuals. Given the prevalence of use and the favorable effects of complementary therapy observed in this analysis, there are reasons to believe that individuals experiencing beneficial effects are likely have a greater commitment to and continue to rely on complementary therapies for health self-management. This may affect the content and quality of patient–provider interaction and adherence to prescribed therapies.[29–31] The potential value of complementary therapies should not be discounted. Awareness of the potential benefits can help health providers better monitor and document complementary therapy use in medical charts,[32] thus enabling providers to effectively support aging patients in making informed, safe, and appropriate choices.

Conclusions

Our results suggest that specific complementary therapies have distinct implications for HRQoL over time. We found favorable effects among users of biologically based therapies and users of manipulative and body-based methods, while other types of complementary therapy had no effects on health status over a 1-year follow-up period. The study results indicate that future population-based research on the effects of complementary therapy use on the functional status, HRQoL, well-being, and successful aging of older adults is warranted. Continued population research with more refined measures of complementary therapy use and health outcomes is needed. This research should try to delineate the specific complementary therapies that predict positive health outcomes. The mechanism for these associations must be delineated.

Disclosure Statement

No competing financial interests exist for any of the authors.

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