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Use of Complementary Therapies for Health Promotion Among Older Adults

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Abstract

This article describes the types of complementary therapies used by older adults for health promotion, and delineates the predisposing, enabling, and need factors associated with their use. One-hundred ninety-five African American and White participants (age 65+) completed a baseline interview and up to six sets of three daily follow-up interviews at monthly intervals. Complementary therapies for health promotion included home remedies, specific foods or beverages, herbs, supplements, vitamins, over-the-counter (OTC) medicine, prayer, exercise, and being active. Although gender, ethnicity, education, and trust in doctors were associated with the use of complementary therapies for health promotion, health information seeking was the predisposing factor most often associated. The enabling factors were also associated with their use. Health information seeking, which reflects a wellness lifestyle, had the most consistent associations with complementary therapy use for health promotion. This health self-management for health promotion may have positive effects on future medical expenditures.

Keywords

health promotion; disease prevention; complementary and alternative medicine; minority aging

Introduction

Health promotion and illness prevention are important strategies for maintaining and improving health, particularly with increasing age. Health promotion is “the process of enabling people to increase control over their health and its determinants, and thereby improve their health” (World Health Organization, 2005, p. 1). Illness prevention is concerned with avoiding disease and involves health promotion behaviors that prevent disease and improve the overall quality of life (Starfield, 2001). Hence, promotion and prevention are overlapping activities (World Health Organization, 2005).

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The desire to promote health has been suggested as a major reason for the increased use of complementary therapies. As early as 1990, Eisenberg et al. (1993) found that 58% of adults used complementary therapies for health promotion. Ongoing research has documented the importance of complementary therapies for health promotion (Astin, Pelletier, Marie, & Haskell, 2000; Barnes, Powell-Griner, McFann, & Nahin, 2004; Brown, Barner, Richards, & Bohman, 2007; Davis, West, Weeks, & Sirovich, 2011; Grzywacz et al., 2005; Wolsko, Eisenberg, Davis, Ettner, & Phillips, 2002). The use of complementary therapies for health promotion has been tied to a “changing worldview” in which individuals take greater responsibility for their own health and are more cautious in accepting direction from conventional health care providers, such as allopathic physicians (Astin, 1998). For example, older adults report the use of herbs such as Echinacea to prevent colds, saw palmetto to prevent prostate problems, and ginkgo biloba to maintain memory (Arcury, Grzywacz et al., 2007). Studies have reported that older adults report the use of home remedies, such as vinegar and honey for health promotion (Arcury, Bell et al., 2006; Grzywacz et al., 2006).

Complementary therapy use is prevalent among older adults (Arcury, Suerken et al., 2006; Arcury et al., 2012; Barnes et al., 2004; Cherniack, 2013; Quandt et al., 2012). Among older adults, the general use of complementary therapies varies by gender, ethnicity, age, and education. More women than men use complementary therapies (Arcury, Suerken et al., 2006; Arcury, Grzywacz et al., 2007; McLaughlin, Adams, Sibbritt, & Lui, 2012). Although about equal proportions of African American and White older adults use complementary therapies (Arcury, Grzywacz et al., 2007; Cherniack et al., 2008; Cui et al., 2012), more African American than White older adults use home remedies (Grzywacz et al., 2006). Complementary therapy use is associated with increasing education (Astin et al., 2000; Najm, Reinsch, Hoehler, & Tobis, 2003). Although a decline in use of complementary therapies is often reported for older adults compared to middle aged adults (Astin, 1998; Bausell, Lee, & Berman, 2001; Ni, Simile, & Hardy, 2002), closer analysis has shown that the decline in use is among those 75 and older (Arcury, Suerken et al., 2006).

Investigations focused on the factors related to the use of complementary therapies for health promotion are rare (Kraft, 2009); more conceptually driven investigations of complementary therapy use for health promotion are needed. Several recent investigations have touched on this topic. Hawk, Ndetan, and Evans (2012) argue that many adults with chronic conditions use complementary therapy practitioners, putting these practitioners in an ideal position to advise these adults on health promotion. Garrow and Egede (2006) and Grzywacz and colleagues (2005), both using data collected by the 2002 National Health Interview Survey, show those who use complementary therapies are more likely to use specific preventive medical care practices, including pneumonia vaccination and influenza vaccination. Davis et al. (2011) use data from the 2007 National Health Interview Survey to examine whether complementary therapies were used by adults for health promotion or for treating illness. They report that more adults use complementary therapies for health promotion (24.7%) than use them for treating illness (17.4%). They found that the Mind-Body domain, which includes meditation, tai chi, and yoga, was the most common form of complementary therapy used for health promotion. Altizer et al. (2012) found that older adults who used complementary therapies for health promotion had lower mental health

related quality of-life than those who did not; these older adults did not differ in physical health-related quality-of-life.

The behavioral model of health services (Anderson & Newman, 1973; Aday & Andersen, 1974) provides a framework for the analysis of complementary therapy utilization for health promotion and illness prevention. This model proposes that health care behavior is influenced by three sets of factors: predisposing, enabling, and need. Predisposing factors exist prior to a disease; they influence whether a person uses a service. They include demographic characteristics, education, and health beliefs. Enabling factors are resources that affect a person's ability to access a health care service. They include income, insurance, and social support. Need factors are a person's health or illness characteristics that require the use of services.

This analysis has two aims. The first aim is to describe the types of complementary therapies used by older adults for health promotion. The second aim is to delineate the predisposing, enabling, and need factors associated with the use of complementary therapies among these older adults.

Method

This study focused on older adults (aged 65 and older) who lived in three counties in south-central North Carolina (Arcury et al., 2011). The study counties were selected because they included large minority populations (50% to 65% minority), and had high rates of poverty, with two of the counties having poverty rates that exceeded one-quarter of their populations. The counties also represented variation on the urban-rural continuum (<http://www.ers.usda.gov/Data/RuralUrbanContinuumCodes/2003/>), such that one was in a metropolitan area with an urban population of 2,500 to 19,999, one was a nonmetropolitan county with urban population of 20,000 or more, and one was a nonmetropolitan county with an urban population of 2,500 to 19,999. Participant recruitment and data collection procedures were approved by the Wake Forest School of Medicine Institutional Review Board (FWA00001435) as Human Protocol IRB00000182. All participants gave signed informed consent.

Participant Recruitment

Inclusion criteria included age 65 years and older, community-dwelling, selfidentified as African American or White, spoke English, could give informed consent, and could complete the series of interviews. The sample was limited to African American and White participants as very few older adults of other racial or ethnic groups reside in the study counties. The sample was stratified by ethnicity (African American and White) and gender with approximately 50 participants recruited into each ethnic-gender group. A site-based procedure (Arcury & Quandt, 1999) was used for participant recruitment. Sites were places, organizations, or services used by members of the population. Participants were recruited at 34 sites, which included county recreation departments (3 different sites), county social service departments (3), county government meetings (2), senior center and congregate meal sites (3), senior housing complexes (3), social and support clubs (7), churches (6), businesses (5), and polling sites (2). In addition, individuals who had participated in

previous research studies, who were referred by other participants, and who were referred by community interviewers were recruited. Lists of potential participants were developed from these sites and stratified by gender and ethnicity.

Two-hundred adults completed baseline interviews, including 52 African American women, 48 African American men, 50 White women, and 50 White men. Twelve individuals refused to participate, for a participation rate of 94.4%. Individuals at specific sites could avoid the interviewers; therefore, the actual participation rate may be lower. Nearly 70% (139) of the participants completed each of six sets of the follow-up interviews. Of the 61 (30.5%) participants who completed fewer than the six sets of follow-up interviews, 23 (11.5% of total sample) completed five sets, five (2.5%) completed four sets, five (2.5%) completed three sets, twelve (6.0%) completed two sets, eleven (5.5%) completed one set, and five (2.5%) completed only the baseline interview. The reasons for participants not completing all six sets of follow-up interviews varied. Three participants died, and nine became too ill to continue. Twenty-two participants changed addresses and phone numbers, and could not be located. Fifteen participants decided that they did not want to continue.

Data Collection

Trained interviewers conducted data collection. Participants completed baseline, in-person interviews, usually in their homes, between April 2008 and May 2009. Following the baseline interviews, participants completed a series of daily-diary follow-up interviews on 3 consecutive days at intervals of at least 1 month. Participants generally completed follow-up interviews on the telephone. However, follow-up interviews were completed in-person with 33 participants who did not have a telephone ($n = 10$), had poor hearing or other physical limitations ($n = 14$), or who disliked speaking on the telephone ($n = 9$). Follow-up data collection was completed in January 2010. Baseline interviews ranged from 45 to 120 min in length. Follow-up interviews generally took 20 min to complete, but ranged in length from 15 to 90 min. Participants were given an incentive valued at US\$10 for completing the baseline interview and each of the first two sets of follow-up interviews. They were given incentives valued at US\$15 for completing each of the third and fourth sets of follow-up interviews, and US\$20 for completing each of the fifth and sixth sets of follow-up interviews. The maximum total incentive received by any participant was US\$100.

Measures

Outcomes measures reflect the use of specific complementary therapies for health promotion and illness prevention. At each follow-up interview, participants were asked, "In the past 24 hours did you _____ with the hope of preventing illness or health declines in the future?" Participants were asked if they used home remedies, food or beverages, herbs, supplements, vitamins, over-the-counter (OTC) medicine, prayer, or done anything else. Participants were asked to specify the therapies they used (e.g., if they reported using a home remedy, they were asked to specify the home remedy); these therapies were checked to ensure they were in the proper category based on earlier analyses (Arcury et al., 2009; Arcury et al., 2011). If they had done anything else, they were asked to specify. A large number of participants reported "exercising" and "being active" as health promotion activities, and they were include as outcomes. For each therapy, two measures were constructed: (a) whether the

participant ever reported using the therapy and (b) the percentage of days the participant reported using the therapy.

Three sets of independent measures, reflecting predisposing factors, enabling factors, and need factors, were included in the analysis. Specific measures for each set of factors are based on those found to be important in other analyses of complementary therapy use (Arcury, Bell et al., 2006; Arcury, Suerken et al., 2006; Arcury, Grzywacz et al., 2007; Arcury et al., 2011, 2012). Predisposing factors included gender; ethnicity (African American, White); educational attainment in the categories less than high school, high school, more than high school; age in years; current tobacco user (cigarettes, snuff, or chew); and uses alcohol. Other predisposing factors included medical skepticism; trust in doctors; and health information seeking. Medical skepticism was based on four items used in the Medical Expenditure Survey (Fiscella, Franks, & Clancy, 1998; Borders, Rohrer, Xu, & Smith, 2004): (a) I can overcome illness without the help from a medically trained professional; (b) Home remedies are often better than drugs prescribed by a doctor; (c) It is individual behavior that determines how soon an individual gets well; and (d) I understand my health better than most doctors. Response options for the items range from strongly disagree (1) to strongly agree (5). Items were summed with higher values (4–20) indicating greater medical skepticism. The mean value for this study was 11.8 (standard deviation (*SD*) = 2.7; $\alpha = 0.60$). Trust in doctors was based on the scale developed by Hall, Camacho, Dugan, and Balkrishnan (2002); it includes 11 items, and has a potential range of 11 to 54. The mean value for this study was 34.7 (*SD* = 6.4; $\alpha = 0.85$). Health information seeking was based on the sum of six items to which participants could respond (a) never, (b) rarely, (c) sometimes, or (d) regularly: reading newspapers, magazines about health, using the Internet to find health information, reading food labels, watching television or listening to radio programs about health, attending health fairs or wellness programs, and seeking advice from family or friends about health issues (Hickey, Rakowski, & Julius, 1988; Rakowski et al., 1990). The potential range of scores was 6 to 24, and the mean value for this study was 14.8 (*SD* = 4.6; $\alpha = 0.77$).

Marital status (currently married versus not currently married) was the first enabling factor. Two measures of financial resources were included (a) whether the participants felt that they had enough money to treat themselves after paying bills, with the values always-usually-often, versus sometimes-rarely-never; and (b) whether the participants had Medicaid. Access to care problems were based on the sum of six items (not able to get appointment, having to pay too much, being nervous, having to wait too long, lack of transportation, amount of paper work); the potential range of scores was 0 to 6, and the mean score was 0.63 (*SD* = 1.1). Finally, participants reported if they put off seeking care in the last 12 months.

The first need factor was the number of chronic conditions, based on the presence of 17 physician-diagnosed chronic conditions reported by the participants. The second need factor was the number of prescription medicines (range of 0 to 19).

Analysis

Descriptive statistics were generated to summarize categorical variables as frequencies and percentages while means and standard deviations were presented for continuous measures.

Bivariate tests of association for the use of a therapy at any point in follow-up with continuous factors were examined using a two-sample *t*-test of difference between users and nonusers, while relationship between use of a therapy with categorical factors was tested using the Fisher's exact test. Given that the percentage of days of use outcome was non-normally distributed, bivariate associations were tested using either the Wilcoxon Rank Sum test or the Kruskal Wallance test. Bivariate results were presented using weighted mean percentage of days used for each category of remedy for categorical measures and the Spearman correlation coefficients for continuous measures. Weighted logistic regression models examined the relationship between any use of each therapy during follow-up and the combination of gender, race, education (less than high school, high school or more), marital status, alcohol use, whether or not there is money left to treat, whether or not there are problems with access to care, trust in doctors, health information seeking, and number of chronic conditions. Some variables with statistically significant bivariate associations with use of complementary therapies for health promotion were excluded from the weighted logistic regression models as they had significant collinear associations with other variables included in the models. Estimates of odds ratio and the 95% confidence intervals (CIs) were presented. Significant associations were indicated by the 95% CIs excluding the value of 1.0. All analyses were conducted using SAS 9.2 (SAS Institute, Cary, NC). The significance level used for all tests was 0.05.

Results

Predisposing, Enabling, and Need Factors

One-hundred ninety-five participants completed at least one set of follow-up interviews (Table 1). They varied in the predisposing, enabling, and need characteristics. By design, the sample was about evenly divided by gender and ethnicity. About one third of the participants had less than a high school education, but 52.8% had formal education beyond high school. Their mean age was 73.8 years, with a standard deviation of 7.0 years. Eleven percent of participants were current smokers, and 20.0% drank alcohol. The mean score for medical skepticism was 11.8 (*SD* = 2.7), for trust in doctors was 34.7 (*SD* = 6.3), and for health information seeking was 14.7 (*SD* = 4.6).

About 60% of the participants were not currently married. About half (46.7%) of the participants felt that they always, usually, or often had enough money to treat themselves after bills were paid. About one-in-five participants had Medicaid. The mean number of problems in accessing care was 0.62 (*SD* = 1.1), and 31.3% had put off seeking health care in the past 12 months. The mean number of chronic conditions among the participants was 5.3 (*SD* = 2.7). The mean number of prescription medicines was 6.0 (*SD* = 3.8).

Remedies Used to Prevent Illness or Future Health Declines

The percentage of participants using each complementary therapy for health promotion and the frequency with which they used these therapies varied widely (Table 2). Several of the therapies were used by one quarter or fewer of the participants, and they were used for a limited number of days. These therapies included home remedies, herbs, being active, and other. Other therapies, including eat or drink something, supplements, and exercise, were

used by about half of the participants, but they were used on a large percentage of days. Most therapies, including vitamins, OTC medicine, and prayer, were used by most participants and they used them on most days.

Bivariate Associations of Predisposing, Enabling, and Need Factors With Remedies Used to Prevent Illness or Future Health Declines

Several of the predisposing factors were associated with the use of the complementary therapies for health promotion. More women than men used food and beverage (56.7% vs. 40.8%, $p = 0.03$) for health promotion and they did so on a greater percentage of days (12.2% vs. 10.5%, $p < 0.05$). More women than men used supplements (60.8% vs. 45.9%, $p = 0.04$) for health promotion and they did so on greater percentage of days (38.3% vs. 29.6%, $p = 0.04$). Women prayed on a greater percentage of days than men (79.1% vs. 68.1%, $p = 0.02$). Men exercised on a greater percentage of days interviewed (32.9% vs. 13.9%, $p < 0.01$). More men than women used activity (36.7% vs. 13.4%, $p < 0.01$), and they used activity on a greater percentage of days (7.4% vs. 2.4%, $p < 0.01$).

More Whites than African Americans used supplements (61.8% vs. 44.1%, $p = 0.02$), and they used them on a greater percentage of days (45.0% vs. 21.3%, $p < 0.01$). More Whites than African Americans also used vitamins (69.6% vs. 55.9%, $p = 0.05$), and they used them on a greater percentage of days (53.8% vs. 36.2%, $p < 0.02$). However, more African Americans than Whites prayed for health promotion (98.9% vs. 89.2%, $p < 0.01$), and they did so on a greater percentage of days (87.0% vs. 62.3%, $p < 0.01$).

Participants with more than a high school education used supplements on a higher percentage of days (42.1%) than those with a high school education (28.4%) or less than high school education (23.0%) ($p < 0.01$). Those with more than a high school education (66.0%) and with a high school education (79.2%) used vitamins more than those with less than a high education (52.9%; $p < 0.05$). Those with more than a high school education used vitamins on a greater percentage of days (54.4%) than those with a high school education (42.7%) and less than a high school education (32.7%; $p < 0.02$). Those with more than a high school education prayed on fewer days (64.2%), than did those with a high school education (86.5%) and less than those with a high school education (84.5%; $p < 0.01$). Age was not associated with using complementary therapies for health promotion.

Those who did not use tobacco used supplements more than those who did use tobacco (63.9% vs. 47.2%, $p = 0.02$), and they used them on more days (39.1% vs. 31.1%, $p < 0.05$). Alcohol drinkers used herbs on a greater percentage of days for health promotion (13.0% vs. 3.8%, $p < 0.05$). More of those who drank alcohol used supplements (52.9% vs. 29.1%, $p < 0.01$) and vitamins (60.9% vs. 41.7%, $p = 0.04$) for health promotion. Those who drank alcohol prayed on fewer days (60.1% vs. 77.3%, $p < 0.01$). Those who drank alcohol exercised on a greater percentage of days (32.4% vs. 20.8%, $p = 0.05$).

Those who used exercise for prevention had a higher mean medical skepticism score than those who did not exercise (12.0 vs. 11.3, $p = 0.03$). Those who used vitamins for health promotion had a greater mean score for trust in doctors than those who did not use vitamins

(35.4 vs. 33.5, $p < 0.05$); there was also a positive correlation between trust in doctors score and percentage of days vitamins were used ($\text{corr} = 0.16$, $p = 0.02$).

Those who prayed for health promotion had a lower mean score for health information seeking than those who did not pray (14.5 vs. 17.8, $p < 0.02$). However, the mean score for health information seeking was greater for those who used food and beverage (16.1 vs. 13.4, $p < 0.01$), who used herbs (17.4 vs. 14.2, $p < 0.01$), who used supplements (15.9 vs. 13.4, $p < 0.01$), who used vitamins (15.6 vs. 13.2, $p < 0.01$), and who exercised (15.8 vs. 13.3, $p < 0.01$) for health promotion. Mean score for health information seeking was positively associated with the percentage of days food and beverages ($\text{corr} = 0.27$, $p < .01$), herbs ($\text{corr} = 0.26$, $p < .01$), supplements ($\text{corr} = 0.26$, $p < .01$), vitamins ($\text{corr} = 0.28$, $p < .01$), and exercise ($\text{corr} = 0.25$, $p < .01$) were used for health promotion.

Among the enabling factors, those who were married prayed on a lesser percentage of days for health promotion than those who were not married (66.9% vs. 78.7%, $p < 0.02$). More married persons engaged in activity (41.3% vs. 13.9%, $p < 0.01$), and they did so on a greater percentage of days (8.1% vs. 2.5%, $p < 0.01$).

More of those who had enough money to treat themselves used home remedies (20.9% vs. 9.6%, $p = 0.04$), supplements (64.8% vs. 43.3%, $p < 0.01$), and vitamins (72.5% vs. 54.8%, $p < 0.01$) for health promotion. They used them on a greater percentage of days: home remedies (4.9% vs. 1.6%, $p = 0.03$), food and beverages (14.0% vs. 9.0%, $p < 0.02$), supplements (43.9% vs. 24.7%, $p < 0.01$), and vitamins (55.9% vs. 36.1%, $p < 0.01$). Those with enough money to treat themselves prayed for health promotion on a lesser percentage of days (68.1% vs. 79.1%, $p = 0.02$). Finally, more of those with enough money to treat themselves engaged in activity (35.2% vs. 16.4%, $p < 0.01$) and they did so on a greater percentage of days (6.9% vs. 2.9%; $p < 0.01$).

Fewer of those who were enrolled in Medicaid used supplements (35.0% vs. 58.1%, $p = 0.01$) or vitamins (47.5% vs. 67.1%, $p = 0.03$), and they used supplements (16.6% vs. 38.3%, $p < 0.01$) and vitamins (21.9% and 51.5%, $p < 0.01$) on fewer days. Those with Medicaid prayed for health promotion on more days (87.7% vs. 70.3%, $p < 0.01$). More participants with no problems with access to health care used food and beverages for health promotion than those who had problems with access (50.8% vs. 44.3%, $p < 0.01$), and they used food and beverages on more days (12.8% vs. 8.7%, $p = 0.02$). Participants with no problems with access to health care exercised on more days than those who had problems (26.2% vs. 17.8%, $p < 0.04$). More participants who had not put off seeking health care in the last 12 exercised for health promotion than those who had put off seeking health care access (63.4% vs. 44.3%, $p < 0.02$), and they exercised on more days (26.6% vs. 15.6, $p < 0.01$).

The need factor number of chronic conditions was inversely associated with the percentage of days prayer was used for health promotion ($\text{corr} = -0.16$, $p = 0.03$). Otherwise, the need factors, number of chronic conditions and number of prescription medicines, were not related to the use of complementary therapies for health promotion.

Multivariate Associations of Predisposing, Enabling, and Need Factors With Remedies Used to Prevent Illness or Future Health Declines

Several of the predisposing factors maintained significant associations with the use of specific complementary therapies for health promotion in multivariate analysis (Table 3). Gender was associated with supplement use such that women had an odds ratio of 2.33 versus men (95% CI [1.08, 5.03]) for the use of supplements for health promotion. Women had an odds ratio of 0.42 (CI [0.20, 0.92]) versus men for using exercise and of 0.39 (CI [0.16, 0.93]) for being active for health promotion. Ethnicity was associated with the use of home remedies for health promotion, such that African Americans had an odds ratio of 3.02 (CI [1.12, 8.10]) versus Whites. For every one-unit increase in trust in doctors, the odds of using an OTC for health promotion increased by 6% (CI [1.00, 1.13]). Seeking health information was the predisposing factor that was most broadly associated with the use of complementary therapies for health promotion. Health information seeking was associated with increased odds of using food and beverages ($OR = 1.14$, CI [1.05, 1.24]), herbs ($OR = 1.20$, CI [1.06, 1.36]), supplements ($OR = 1.08$, CI [1.00, 1.17]), vitamins ($OR = 1.13$, CI [1.04, 1.23]), and exercise ($OR = 1.16$, CI [1.07, 1.26]) for health promotion. Health information seeking was associated with decreased odds of using prayer for health promotion ($OR = 0.79$, CI [0.64, 0.99]).

Several enabling factors also maintained significant associations with the use of specific complementary therapies for health promotion. Being married was associated with decreased odds of using herbs ($OR = 0.33$, CI [0.11, 0.99]), but increased odds of being active ($OR = 2.71$, CI [1.19, 6.19]). Having money to treat yourself after bills are paid was associated with increased odds of using home remedies ($OR = 4.49$, CI [1.54, 13.09]), and of using supplements ($OR = 2.21$, CI [1.04, 4.68]). Finally, having no problems with access to health care was associated with increased odds of using herbs ($OR = 2.28$, CI [1.14, 4.57]).

Discussion

These older adults use complementary therapies for health promotion, and they use some of these complementary therapies frequently. Almost all of these older adults pray for health promotion, and they do so almost every day. Most also use OTC medicine. At least half use supplements and vitamins for health promotion, and they use these for about 3 days out of every 5, and more than half use exercise but do so on fewer than 2 of 5 days. Other complementary therapies used by many participants for health promotion include specific food or beverages and being active. Few of the participants use home remedies for health promotion. The types of complementary therapies used for health promotion among these older adults reflect the general literature on complementary therapy among older adults in the general population (Arcury et al., 2000; Arcury, Suerken et al., 2006; Barnes et al., 2004; Brown et al., 2007; Cherniack et al., 2008; Cui et al., 2012; Grzywacz et al., 2006; Najm et al., 2003).

This analysis also reflects previous research documenting the associations of enabling and predisposing factors with the use of complementary therapies, although this analysis focused on the use of complementary therapies for health promotion. The enabling factors of being married, having money to treat yourself after bills are paid, and having no problems with

access to health care were each associated with the use of a few complementary therapies for health promotion. Having money to treat yourself after bills are paid was also associated with the use of home remedies and supplements. None of the need factors was associated with use of complementary therapies for health promotion. This is not surprising. These need factors were measures of current health problems, while the focus in using these therapies was on prevention.

Consistent with previous research, individuals differ in their use of complementary therapies in terms of predisposing factors, gender, ethnicity, and education (Cherniack et al., 2008; Grzywacz et al., 2005). For example, gender was related to the use of supplements; this probably reflects, in part, the use of calcium by women to prevent osteoporosis. Other analyses have also shown that African American older adults make greater use of home remedies (Arcury, Bell et al., 2006; Grzywacz et al., 2006). In the bivariate analysis, drinking alcohol was associated positively with the use of several complementary therapies, including herbs, supplements, vitamins, and exercise, but negatively associated with the use of prayer for health promotion. The residents of the study counties are generally conservative Christians (Arcury, Quandt, McDonald, & Bell, 2000; Arcury, Stafford et al., 2007), for whom drinking alcoholic beverages is prohibited. The use of alcohol in this context is often a marker for more liberal attitudes.

The predisposing factor most associated with use of the most complementary therapies for health promotion was health information seeking. Those who sought more information about health were more likely to use food and beverages, herbs, supplements, and vitamins for health promotion. They were more likely to exercise. However, they were less likely to pray. Other analyses have not examined the associations of health information seeking with complementary therapy use for health promotion.

Astin (1998) argues that the use of complementary therapies is part of a changing worldview in which individuals take greater responsibility for their own health. Davis and colleagues (2011) also argue that the use of complementary therapies for health promotion is part of a "wellness lifestyle." The importance of health information seeking among the participants who use complementary therapies for health promotion reflects a changing health worldview and wellness lifestyle in which individuals take greater responsibility for their own health (Astin, 1998; Davis et al., 2011). The components of the health information measure indicate the degree to which some of these older adults are taking responsibility for their health. Forty-one percent reported regularly reading newspapers, magazine or books about health, 44.2% reported reading food labels, 37.5% reported watching television or listening to radio programs about health, 24.5% reporting seeking advice from family or friends about health issues, and 13.5% had attended a health fair or wellness program. Although a small number, that 15 (7.5%) participants reported using the Internet to find health information indicates the growing importance of the Internet in rural populations (Hale, Cotten, Drentea, & Goldner, 2010; LaRose, Gregg, Stover, Straubhaar, & Carpenter, 2007). However, it is not clear whether older adults' health information seeking efforts represent actual improvements in their health or health behaviors (Tu & Cohen, 2008; Wicks, 2004). Older adults, especially those with low health literacy, may not be making a careful and clear critique of the information they access (Fox, 2005). This may be a concern particularly for

older adults who use less valid information or credible sources to promote health without consulting their physicians or other health care providers.

The results of this analysis must be considered in the context of the study limitations. These data were collected from a relatively small sample of older adults residing in a few counties in North Carolina. A random selection procedure was not used. Therefore, caution should be used in generalizing results. Although several categories of complementary therapies were used, the specific types of therapies were too diverse to include in the analysis. All predisposing, enabling, and need factors that might be related to complementary therapy use could not be included in this analysis. Therefore, the analysis may not specify potentially important associations with complementary therapy use for health promotion. Finally, the multivariate analysis included nine separate models; this could have inflated Type I error. However, the study did engage 200 older adults, with most of them participating over 6 months. The participants provided information on the complementary therapies they used specifically for health promotion at each of the six follow-up contacts.

Older adults are using several complementary therapies for health promotion on a regular basis. The use of complementary therapies for health promotion is associated most consistently with health information seeking, indicating a wellness lifestyle. This health self-management for health promotion may have positive effects on future medical expenditures. However, the self-prescription of some health promotion therapies may increase the out-of-pocket costs for individuals. Future research on health self-management and use of complementary therapies should focus on issues surrounding health promotion. This research should also investigate how health information seeking and wellness lifestyles affect the inclusion of complementary therapies in health promotion and health self-management.

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Table 1

Predisposing, Enabling, and Need Factors, Older Adults in Three Rural North Carolina Counties, 2008–2009
(*n* = 195).

Characteristics	<i>n</i>	%	Mean	<i>SD</i>
Predisposing factors				
Gender				
Female	97	49.7		
Male	98	50.3		
Ethnicity				
African American	93	48.0		
White	102	52.0		
Educational attainment				
Less than high school	68	34.9		
High school	24	12.3		
More than high school	103	52.8		
Age			73.8	7.0
Current smoker	21	11.0		
Use alcohol	39	20.0		
Medical skepticism (range 4–20)			11.8	2.7
Trust in doctors (range 11–54)			34.7	6.3
Health information Seeking (range 6–24)			14.7	4.6
Enabling factors				
Marital status				
Currently married	80	41.0		
Not currently married	115	59.0		
Money to treat yourself after bills are paid				
Always, usually, often	91	46.7		
Sometimes, rarely, never	104	53.3		
Medicaid	40	21.0		
Problems with access to health care (range 0–6)			0.62	1.1
Put off seeking care in the last 12 months	61	31.3		
Need factors				
Number of chronic conditions (range 0–17)			5.3	2.7
Number of prescription medicines (range 0–19)			6.0	3.8

Table 2

Number and Percentage of Older Adults Who Used a Category of Remedies in the Last 24 Hours to Prevent Illness or Future Health Declines, and the Mean Percentage of Days the Category of Remedies Were Used.

Home remedies		
Number of users	29	
Percentage of users	14.9	
Mean percentage (<i>SD</i>) of days used *	19.6	(1.5)
Eat or drink something		
Number of users	95	
Percentage of users	48.7	
Mean percentage (<i>SD</i>) of days used *	22.2	(1.5)
Herbs		
Number of users	31	
Percentage of users	15.9	
Mean percentage (<i>SD</i>) of days used *	32.3	(2.3)
Supplements		
Number of users	104	
Percentage of users	53.3	
Mean percentage (<i>SD</i>) of days used *	60.0	(2.5)
Vitamins		
Number of users	123	
Percentage of users	63.1	
Mean percentage (<i>SD</i>) of days used *	69.9	(2.5)
Over-the-counter medicine		
Number of users	160	
Percentage of users	82.1	
Mean percentage (<i>SD</i>) of days used *	51.9	(2.0)
Prayer		
Number of users	183	
Percentage of users	93.8	
Mean percentage (<i>SD</i>) of days used *	77.8	(2.1)
Exercise		
Number of users	112	
Percentage of users	57.4	
Mean percentage (<i>SD</i>) of days used *	38.5	(1.9)
Being active		
Number of users	49	
Percentage of users	25.1	
Mean percentage (<i>SD</i>) of days used *	17.4	(1.1)
Other		
Number of users	33	

Percentage of users	16.9
Mean percentage (<i>SD</i>) of days used*	19.8 (1.1)

* Mean and standard deviation weighted for proportion of total interview days.

Table 3

Multivariate Associations of Predisposing, Enabling, and Need Factors With Remedies Used to Prevent Illness or Future Health Declines.

	Remedy categories									
	Home remedies	Food & beverages	Herbs	Supplements	Vitamins	Over-the-counter	Prayer	Exercise	Being active	
Predisposing factors										
Females (REF: Males)	OR 95% CI	2.13 [0.75, 6.06]	1.68* [0.79, 3.59]	0.88 [0.31, 2.46]	2.33* [1.08, 5.03]	1.24 [0.57, 2.70]	1.24 [0.50, 3.08]	2.75* [0.53, 14.25]	0.42* [0.20, 0.92]	0.39* [0.16, 0.93]
African Americans (REF: Whites)	OR 95% CI	3.02 [1.12, 8.10]	1.22 [0.6, 2.49]	1.47 [0.55, 3.92]	0.71* [0.35, 1.44]	0.70* [0.34, 1.43]	1.04 [0.44, 2.46]	9.34* [0.98, 89.38]	1.07 [0.53, 2.17]	0.77 [0.34, 1.76]
Less than high school (REF: High school or greater)	OR 95% CI	0.4 [0.14, 1.14]	0.6 [0.28, 1.29]	1.06 [0.38, 2.91]	0.98* [0.46, 2.07]	0.52* [0.24, 1.13]	0.95 [0.39, 2.35]	1.29* [0.2, 8.36]	0.68 [0.32, 1.45]	0.82 [0.33, 2.02]
Alcohol user (REF: No use)	OR 95% CI	0.89 [0.26, 3.00]	0.97 [0.42, 2.26]	0.40* [0.14, 1.16]	0.42* [0.17, 1.03]	0.70* [0.29, 1.71]	0.45 [0.13, 1.49]	1.84* [0.39, 8.69]	0.84* [0.35, 2.00]	1.38 [0.53, 3.61]
Trust in doctors	OR 95% CI	0.97* [0.90, 1.03]	1.01 [0.42, 2.26]	1.04 [0.97, 1.11]	1.02 [0.97, 1.08]	1.05* [0.99, 1.10]	1.06 [1.00, 1.13]	1.01* [0.91, 1.11]	1.00 [0.95, 1.05]	0.99 [0.94, 1.05]
Health information seeking	OR 95% CI	1.06 [0.96, 1.19]	1.14* [1.05, 1.24]	1.20* [1.06, 1.36]	1.08* [1.00, 1.17]	1.13* [1.04, 1.23]	1.02 [0.93, 1.12]	0.79* [0.63, 0.99]	1.16* [1.07, 1.26]	0.99 [0.91, 1.09]
Enabling factors (REF: Not married)	OR 95% CI	1.84 [0.66, 5.16]	0.81 [0.38, 1.75]	0.33 [0.11, 0.99]	0.92 [0.43, 1.99]	1.46 [0.67, 3.18]	1.22 [0.48, 3.08]	1.87* [0.37, 9.38]	0.86* [0.40, 1.85]	2.71* [1.19, 6.19]
Money to treat yourself after bills paid (REF: Sometimes or rarely/never)	OR 95% CI	4.49* [1.54, 13.09]	2.01* [0.95, 4.22]	1.56 [0.55, 4.40]	2.21* [1.04, 4.68]	1.74* [0.82, 3.71]	1.31 [0.52, 3.27]	0.76* [0.14, 4.07]	1.00 [0.48, 2.08]	2.30* [0.98, 5.41]
No problems with access to health care (REF: Some problems)	OR 95% CI	1.77 [0.63, 4.94]	2.28* [1.14, 4.57]	0.59 [0.23, 1.50]	0.99 [0.49, 1.99]	0.94 [0.46, 1.88]	0.63 [0.27, 1.49]	0.35 [0.06, 2.09]	1.83* [0.93, 3.61]	0.98 [0.43, 2.24]
Need factors (REF: No chronic conditions)	OR 95% CI	1.09 [0.91, 1.30]	1.01 [0.9, 1.15]	1.10 [0.93, 1.31]	1.13 [1.00, 1.28]	1.08 [0.95, 1.22]	1.00 [0.86, 1.17]	0.82 [0.62, 1.07]	1.00 [0.89, 1.13]	1.01 [0.88, 1.17]

Note:

* Significant association in bivariate analysis. Boldface values indicate statistically significant associations in the multivariate analysis.