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Relationship Between Nonprescribed Therapy Use for Illness Prevention and Health Promotion and Health-Related Quality of Life

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Abstract

Objectives—This study describes the nonprescribed therapy use (prayer, over-the-counter medications [OTC's], home remedies, vitamins, herbs and supplements, and exercise) for health promotion among rural elders. It also delineates the association of such therapy use with physical and mental health-related quality of life (HRQoL).

Method—The sample ($N = 200$) consisted of African American and White elders from south-central North Carolina. Participants completed baseline interviews and repeated measures of nonprescribed therapy use over a 6-month follow-up.

Results—Prayer had the highest percentage (80.7%) of use for health promotion followed by OTC (54.3%); vitamins only (49.3%); herbs and supplements (40.5%); exercise (31.9%); and home remedies (5.2%). Exercise was significantly associated with better physical HRQoL ($p < .05$). However, elders who used nonprescribed therapies had poorer mental HRQoL than nonusers, adjusting for potential confounders.

Conclusion—This analysis suggests that use of some nonprescribed therapies for health promotion is associated with poorer mental HRQoL.

Keywords

nonprescribed therapy use; health-related quality of life (HRQoL)

Introduction

Nonprescribed therapies are widely used for health management by older adults (Arcury et al., 2006; Arcury et al., 2011; Eisenberg et al., 1993; Eisenberg et al., 1998; Goldstein et al., 2005). Overall, 28% to 88% of older adults use nonprescribed therapies (Arcury et al., 2006; Cheung, Wyman, & Halcon, 2007; Ness, Cirillo, Weir, Nisly, & Wallace, 2005; Ruchlin &

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Declaration of Conflicting Interests

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Lachs, 1999). Nonprescribed therapies commonly used in older adults are home remedies, herbs, supplements, over-the-counter medicines (OTC's) and vitamins, prayer and spirituality, and exercise (Arcury et al., 2006; Astin, Pelletier, Marie, & Haskell, 2000; Foster, Phillips, Hamel, & Eisenberg, 2000; Grzywacz et al., 2006). Greater use of nonprescribed therapies is reported by women, persons of Hispanic and Asian ethnicity, middle-aged adults, and those with higher education and greater income (Arcury et al., 2006a; Arcury et al., 2011; Astin et al., 2000; Barnes, Powell-Griner, McFann, & Nahin, 2004). Reasons for using nonprescribed therapies vary (Astin, 1998; Bishop & Lewith, 2008; Carboon, 2008; Long, 2002; Richardson, 2004; Sasagawa, Martzen, Kelleher, & Wenner, 2008), but they are generally used to treat an existing health condition or to prevent illness and promote health (Grzywacz et al., 2005; Long, 2002; Schuster, Dobson, Jauregui, & Blanks, 2004).

Although studies on nonprescribed therapy use for treatment of diseases are expanding, data on health promotion and prevention aspects are limited. For the purpose of this study, health promotion is defined as “the process of enabling people to increase control over their health and its determinants, and thereby improve their health” (WHO, 2005). Illness prevention is not only concerned with avoiding disease, but can also involve health-promotion behaviors that prevent disease and improve the overall quality of life (Starfield, 2001). Hence, promotion and prevention have overlapping and complementary activities (WHO, 2005). However, nonprescribed therapy use for prevention of disease and maintenance of health has increased over the past two decades. Studies in the 1990's by Eisenberg found that 58% of respondents used nonprescribed therapies for illness prevention and health promotion (Eisenberg et al., 1993; Eisenberg et al., 1998). Since that time, more studies have demonstrated widespread and growing nonprescribed therapy use to promote wellness (Astin et al., 2000; Barnes et al., 2004; Brown, Barner, Richards, & Bohman, 2007; Davis, West, Weeks, & Sirovich, 2011; Grzywacz et al., 2005; Wolsko, Eisenberg, Davis, Ettner, & Phillips, 2002). The popularity of nonprescribed therapy use for prevention is due in part to the era of health promotion when a strong moral obligation has been placed on individuals for health and wellness and personal responsibility for health (Goldstein, 2000; Petersen & Lupton, 1996). Some investigators have suggested that for health promoting behaviors, an important step must be to determine if health practices can impact health outcomes (O'Donnell, 2004). By and large, the impact of nonprescribed therapies in health promotion has not been examined; data on the relationship between nonprescribed therapy use in prevention and health outcomes in older adults are not available.

Health-related quality of life (HRQoL) is increasingly used as a primary health outcome in clinical research and patient care (CDC, 2000; Easterlin, 2006; Skarupski et al., 2007; Smith, Avis, & Assmann, 1999). The U.S. Department of Health and Human Services' Healthy People 2020 objectives on older adults are designed to promote HRQoL for this population (DHHS, 2010). Successful aging through the maintenance of health and HRQoL is important for older adults. Age has a substantial influence on HRQoL due to the increasing prevalence of morbidity, physical disability, and cognitive impairment with age (Netuveli, Wiggins, Hildon, Montgomery, & Blane, 2006; Webb, Blane, McMunn, & Netuveli, 2011), and more attention is now being focused on factors that impact HRQoL at older ages.

Many nonprescribed therapy approaches place an emphasis on emotional and physical well being as an integral component of health (Rakel, 2007), yet data on the effects of nonprescribed therapy use on HRQoL are limited (Nguyen, Grzywacz, Lang, Walkup, & Arcury, 2010). Most studies documenting a positive relationship between nonprescribed therapy use and HRQoL were based on subgroups of older adults with certain diagnostic characteristics (e.g., diabetes, arthritis, and cancer) rather than including community-dwelling older adults (Ganz et al., 2002; Hunnicut, Grady, & McNearney, 2008; Pilkington, Stenhouse, Kirkwood, & Richardson, 2007; Ramsey, Spencer, Topolski, Belza, & Patrick, 2001). Furthermore, measures of nonprescribed therapy use were often based on whether a participant used it at least once over an *extended* period of time, often over the past 12 months (Nguyen et al., 2010). This coarse approach to measurement is problematic because it is not possible to know whether individuals used a therapy more than once, or the intended purpose for using the nonprescribed therapy (i.e., for disease prevention, health promotion, or to treat a diagnosed disease). Furthermore, a retrospective appraisal confounds the ability to determine if use of nonprescribed therapies precedes changes in HRQoL.

The aim of this study is to examine the relationship between HRQoL and nonprescribed therapy use for illness prevention or health promotion. This article uses repeated measures of nonprescribed therapy use and HRQoL collected from a multiethnic sample of rural older adults to address two specific aims. The first aim is to describe the frequency of nonprescribed therapy use for health promotion over a 6-month follow-up. The second is to determine the short-term (6 months) association of nonprescribed therapy use in prevention with physical and mental HRQoL. Accomplishing these aims is significant because it is one of the first assessments of possible differences in health outcomes by nonprescribed therapy use to promote health in older adults.

Method

Participants

The sample included community-dwelling adults aged 65 and older who self-identified as African American or White, spoke English, and were in sufficiently good health to give informed consent and complete a series of interviews. The sample design called for the sample to be stratified by ethnicity (African American and White) and gender so that approximately 50 participants were recruited into each ethnic-gender group. The four balanced groups would allow for potential analyses based on ethnicity and gender. We used three methods, including site-based sampling (Arcury & Quandt, 1999), word-of-mouth referral, and a registry of existing participants from previous aging studies, to *recruit participants*. Participants were recruited from 34 sites, including county social service 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). The research protocol was approved by the Wake Forest University School of Medicine Institutional Review Board, and all participants gave signed informed consent.

Study Design

A repeated measures design was used in which participants first completed baseline, in-person interviews. The design of this study has been described in detail (Arcury et al., 2011). Baseline interviews were completed from April 2008 through May 2009. Participants then completed a series of daily-diary follow-up interviews on three consecutive days at intervals of at least one month. This prospective study design offers several enhancements over designs used in the literature because the daily-diary portion provided a more fine-grained assessment of participants' use of nonprescribed therapies, whereas the monthly observations provide a more comprehensive appraisal of older adults' HRQoL. Furthermore, the month-to-month repeated measure design is valuable because the narrow temporal window between assessments of nonprescribed therapy use and HRQoL minimizes potential confounding. The follow-up interviews were generally conducted on the telephone. Follow-up data collection was completed in January 2010.

Measures

Baseline—At baseline, participants reported their gender, age, race, marital status, educational attainment (less than high school, high school, more than high school), income (above or below US\$13,700, the poverty cutoff), total chronic conditions, present smoker status, and present drinker status. Number of chronic health conditions was assessed by self-reports of conditions from the Charlson index (Charlson, Pompei, Ales, & MacKenzie, 1987). Participants were asked if they were ever told by a doctor they had one of 16 common conditions (e.g., arthritis, heart disease, diabetes, and osteoporosis). Affirmative responses were summed and scored such that a higher number indicates a greater number of chronic health conditions.

Follow-up—At each follow-up interview, participants were asked if they had used one of 6 classes of therapies explicitly for illness prevention or health promotion. The classes of therapies included the following: (a) prayer; (b) use of an over-the-counter (OTC) medicine (e.g., Ben Gay); (c) use of a home remedy (e.g., honey, vinegar, olive oil, and whisky); (d) use of vitamins; (e) use of an herb or supplement; and (f) exercise (e.g., formal exercise, back exercise, and yoga). Household activities (e.g., gardening, cleaning) were not considered exercise. In this study, the six follow-ups with three daily interviews were treated as six observations (rather than 18). The time horizon was implemented to control for seasonal variation of health. The three days of follow-up per month capture a breadth of health information and a more accurate indicator of actual nonprescribed therapy use. Use of each therapy was defined as any use of the specific therapy any of the three days within the monthly observation period, and non-use was defined as no use of the therapies at all during the three days within each monthly observation period.

HRQoL was measured using the acute form of the Short Form Survey, version 2 (SF-36) (Ware, 2002) on the last day of each set of monthly follow-up visits. The acute form of the SF-36 measures multiple dimensions of health over the past four weeks representing discrete aspects of a person's functioning most likely to be affected by disease and treatment. Published scoring procedures were used to arrive at two composite summary indicators of

physical HRQoL and mental HRQoL (Ware et al., 1995; Ware, Kosinski, Turner-Bowker, & Gandek, 2002). A higher score on each scale indicates better HRQoL.

At each follow-up interview, participants were also asked if they had experienced each of 40 symptoms such as runny nose, cough, indigestion, difficulty sleeping, and low energy. Affirmative responses were summed and scored such that a higher number indicates more symptoms at each follow-up interview.

Analysis

All analyses were performed using SAS v9.2 (SAS Institute, Cary, NC). Descriptive statistics of baseline characteristics, the nonprescribed therapy use for illness prevention and health promotion during follow-up, as well as the physical and mental HRQoL measures over the 6 months are presented as frequency and percentage for categorical variables, and mean and standard deviation for continuous variables. Separate mixed effects models *with unstructured dependence structure* were fit to examine the association between use of different types of nonprescribed therapies and physical and mental HRQoL across the six follow-up interviews. Model 1 examined the association between nonprescribed therapy use and HRQoL, adjusting for time. Model 2 adjusted for time, but also included several personal characteristics including baseline age, gender, marital status, race, education, income, total chronic conditions, smoking status, and alcohol use. Then, in Model 3, the total number of symptoms at each monthly follow-up was added to the model as a time-varying covariate. The type I error rate was fixed at 0.05.

Results

A total of 200 African American and White older adults completed baseline interviews. Twelve individuals asked to participate refused, for a participation rate of 94.4%. All six sets of follow-up interviews were completed by 151 (75.5%) participants. Of the 49 (24.5%) participants who completed fewer than the six sets of follow-up interviews, 10 (5.0%) completed five sets, 5 (2.5%) completed four sets, 7 (3.5%) completed three sets, 6 (3.0%) completed two sets, 12 (6.0%) completed one set and 9 (4.5%) 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 (e.g., they thought the interviews took too much of their time; they did not like the content of the interviews).

Participants were about evenly divided between female (51%) and male (49%) (Table 1). The average (*SD*) age of participants was 73.8 (6.9) years. Approximately half of the participants were White (51.5%) and half (48.5%) were African American. Most of the participants were not presently married (59.5%). About half (53.0%) had greater than high school education, 13.0% had graduated from high school, and 34.0% had completed less than high school. Seventy-five percent of participants had an annual income of greater than the federal poverty level. Participants reported 5.2 chronic conditions, on average. Twenty-two percent were present smokers, and 19.5% were present drinkers of alcohol. The average number of symptoms reported by older adults remained relatively stable for more than six

months, ranging from 7.6 symptoms to 9.7 symptoms (data not shown). Means within physical HRQoL and mental HRQoL had minimal variability across the six follow-ups (Table 2). The average mental HRQoL ($M = 56.4$; $SD = 7.7$) remained higher than the average physical HRQoL ($M = 42.1$; $SD = 10.9$) across all six sets of follow-up.

The proportion of participants using each category of therapy remained stable across time (Table 3). Prayer was the most widely used therapy among the older adults; between 78.2% and 83.3% used it for health promotion during the 6-month observation period. About 50% to 60% of older adults used OTC, whereas about half (49.3%) used vitamins. Approximately 40% used herbs and supplements. Commonly reported vitamins, herbs, and supplements included vitamin C, vitamin B complex, garlic, ginger, green tea, cod liver oil, calcium, and glucosamine/chondroitin. Exercise was also used to prevent illness or promote health, with use ranging from 26.1% to 34.7% across the observation period. The smallest proportion of use was for home remedies with rates of use between 3.4% and 6.8%. Commonly reported home remedies included vinegar, baking soda, and Epsom salts.

The use of exercise for illness prevention and health promotion was associated with better physical HRQoL, such that active adults reported higher physical HRQoL than less active adults ($p < .05$), adjusting for time, age, gender, marital status, race, education, income, total chronic conditions, smoking status, alcohol use, and time varying number of symptoms (Table 4). Users of vitamins, herbs and supplements, and home remedies also reported better physical HRQoL, though these relationships were marginally significant. Users of prayer, vitamins, and home remedies had poorer mental HRQoL ($p < .05$). The association between use of OTC and poorer mental HRQoL was substantially attenuated after adjusting for personal characteristics and time varying number of symptoms.

Discussion

A large percentage (42.2%) of older adults in this study reported using at least one nonprescribed therapy explicitly for illness prevention or illness promotion across the six month observation period. This is a higher percentage of use than what was previously reported based on national survey data (Arcury et al., 2007). Prayer had the highest percentage (80.7%) of use followed by OTC (54.3%); vitamins only (49.3%); herbs and supplements (40.5%); exercise (31.9%); and home remedies (5.2%). The percentage of participants using each type of therapy remained relatively stable across the six follow-ups.

This is the first community-based study that used repeated measures to examine the association between nonprescribed therapy use for health promotion and health outcomes in older adults. This analysis found that use of exercise was associated with better physical HRQoL. It is not surprising that active older adults have better physical HRQoL than their less active counterparts. Regular exercise improves physical health by reducing pain, improving physical function, and significantly delaying disease and disability progression (Ellingson & Conn, 2000; Jakobsson & Hallberg, 2002; Spirduso & Cronin, 2001). Previous reviews have shown more consistent and stronger associations between exercise and physical functioning, but the association between exercise and mental health has been mixed (Bize, Johnson, & Plotnikoff, 2007). We found that use of exercise for health promotion was

not associated with mental HRQoL. There are several possible reasons for not finding a significant association between use of exercise and mental HRQoL. It is possible that 6 months is not sufficient to show a meaningful change in mental HRQoL. Another explanation for the null association is that mental health was measured more broadly, using composite scores rather than individual dimensions. The association was examined in a specific subgroup (older adults), and a different set of confounders was used in the analyses compared with previous studies (e.g., Brown et al., 2003; Lindholm, Brevinge, Bergh, Korner, & Lundholm, 2003). Last, the negative relationship with mental HRQoL and nonprescribed therapy suggests the possibility of reverse causation, that is, people with poorer mental HRQoL revert to the use of nonprescribed therapies. This finding merits further investigation.

A consistent finding in this study was the relationship between nonprescribed therapy use for health promotion and poorer mental HRQoL. The reasons for this are not well understood, but may revolve around the act of vigilant coping in the face of perceived or actual threats to health. Older adults are vigilant in responding to health threats (Leventhal, Leventhal, & Shaefer, 1992). Loss of health is feared by older adults and is one reason often associated with nonprescribed therapy use to prevent illness or promote health. Paradoxically, it has been suggested that vigilance demands considerable effort and produces significant mental stress as well as physiological stress reactions (Davies & Parasuraman, 1982; Hancock & Warm, 2003). Our data may reflect a group of older adults with high vigilance tasks that facilitate the relationship between nonprescribed therapy use and poorer mental HRQoL. Our results may also suggest that those who are using nonprescribed therapies may have compromised physical health leading some to try nonprescribed therapies in hopes of improving their health. However, if these efforts produce no noticeable improvement, an emotional reaction of anxiety or stress may occur, contributing to a poorer mental HRQoL. Possible mechanisms underlying this association remain to be investigated.

There are several notable strengths in this analysis. The analysis is based on the use of repeated measures of multiple nonprescribed therapies and HRQoL across a six month period of study enrollment. Whereas cross-sectional data cannot provide detailed insight on nonprescribed therapy use over time in relation to HRQoL outcomes, our repeated-measures data is able to offer temporal insight to how nonprescribed therapy use may affect health outcomes. Past studies have relied on gross measures of nonprescribed therapy utilization, such as life time use of general therapies, or use of therapies in the past year or three months. This study looks at specific categories of nonprescribed therapies and provides details of use for a broad range of therapies. The sample involves older adults in rural communities that have not been well-represented in previous studies.

There are several limitations that need to be recognized while interpreting the study findings. First, this study was unable to complete six sets of follow-up interviews for 30% of the participants. Furthermore, selection of study participants was not random. The possibility of some self-selection bias in the sample exists, which would limit the generalizability and add caution to the interpretation of the results. Not all forms of nonprescribed therapies could be included; other forms of therapies (e.g., biofeedback and

meditation) might be more related to HRQoL. Because diary studies impose substantial demands on participants, the present study focused on common therapies to reduce participant burden. Finally, this research examined the association between nonprescribed therapy use and HRQoL; results should not be interpreted as evidence for effectiveness of nonprescribed therapies *as it was not the aim of this study*.

Despite these limitations, the results suggest important implications. HRQoL is particularly an 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 (Kroenke, Kubzansky, Adler, & Kawachi, 2008; Singh, Nelson, Fink, & Nichol, 2004). Nonprescribed therapy approaches often discuss HRQoL in the context of health promotion and disease prevention, yet there is limited data regarding the health effects of nonprescribed therapy use for illness prevention or health promotion. We designed a study of six months' duration to provide some insight on the relationship between use of nonprescribed therapies for health promotion and HRQoL. We found that older adults who use nonprescribed therapies have a lower self-rated, mental HRQoL than nonusers of such therapies. This inverse relationship between nonprescribed therapies use and mental HRQoL suggests that practitioners who observe a patient's use of nonprescribed therapies may want to probe for an underlying mental health issues that require attention. Our findings confirm that randomized trials remain necessary to evaluate the impact of nonprescribed therapy use in health promotion or disease prevention and the impact of such therapies on HRQoL. Last, the results have an important implication for health care providers and caregivers who care for aging patients. Given the prevalence of age-associated illnesses and nonprescribed therapy use observed in this analysis, there are reasons to believe that older patients are likely to continue to rely on nonprescribed therapies for prevention of disease and maintenance of health. Knowledge about what self-care practices older patients use may enable practitioners to understand and have open discussion with older patients and caregivers. Such open discussions can help providers and caregivers better monitor and identify potentially harmful self-care behaviors and encourage safer, more appropriate choices.

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Biography

Kathryn P. Altizer has a masters of science degree in applied experimental psychology from Augusta State University. She has been involved in rural, aging studies at Wake Forest School of Medicine for 5 years. Her particular research interest is mental health among older adults.

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Table 1Characteristics of the Study Sample ($N = 200$).

<i>N(%) or $M \pm SD$</i>	
Overall	200
Female (%)	102 (51.0)
Age	73.8 ± 6.9
White (%)	103 (51.5)
Married (%)	81 (40.5)
Education (%)	
Less than high school	68 (34.0)
High school	26 (13.0)
More than high school	106 (53.0)
Income < US\$13,700 (%)	53 (27.5)
Total chronic conditions	5.2 ± 2.7
Present smoker (%)	22 (11.0)
Present drinker (%)	39 (19.5)

Table 2

Physical and Mental Component Scores by Follow-Up.

	<u>Physical HRQoL</u>			<u>Mental HRQoL</u>	
	<i>N</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Follow-up 1	190	40.9	10.9	56.1	8.0
Follow-up 2	177	41.9	11.5	56.6	8.4
Follow-up 3	170	42.4	10.5	56.2	7.9
Follow-up 4	165	42.7	10.9	56.5	6.8
Follow-up 5	161	42.2	11.1	56.3	7.7
Follow-up 6	151	42.6	11.0	56.8	7.1

Note: HRQoL = health-related quality of life.

Table 3

Therapy Use for Illness Prevention and Health Promotion Across 6 Observations.

	F1		F2		F3		F4		F5		F6	
	n	%	n	%	n	%	n	%	n	%	n	%
Therapy												
Prayer	159	83.3	143	79.4	141	80.6	139	83.2	129	79.6	118	78.2
OTC	106	55.0	90	50.0	101	57.7	96	57.5	85	52.5	79	52.3
Vitamins	87	45.6	92	51.1	80	45.7	85	50.9	83	51.2	8	5.3
Herbs and supplements	74	38.7	73	40.6	74	42.3	66	39.5	65	40.1	77	51.0
Exercise	62	32.5	47	26.1	56	32.0	58	34.7	53	32.7	63	41.7
Home remedies	13	6.8	10	5.6	6	3.4	10	6.0	7	4.3	50	33.1

Note: OTC = over-the-counter.

Table 4

Association Between Each Major Therapy Use and Physical and Mental over 6-Month Follow-Up.

Physical HRQoL			Mental HRQoL	
	Estimated coefficient *	P-value	Estimated coefficient *	P-value
Predictors				
Prayer				
Model 1	−0.8067	0.2426	−1.5312	0.0164
Model 2	−0.5530	0.4192	−1.8442	0.0047
Model 3	0.1202	0.8563	−1.2406	0.0466
OTC				
Model 1	0.2750	0.5471	−0.8963	0.0419
Model 2	0.1440	0.7537	−0.8036	0.0722
Model 3	0.5835	0.1922	−0.2042	0.0635
Vitamin				
Model 1	0.5377	0.3558	−1.2427	0.0325
Model 2	0.4913	0.2046	−1.2433	0.0350
Model 3	0.6372	0.0754	−1.0745	0.0503
Herb/supplement				
Model 1	0.1972	0.4115	−0.1430	0.7963
Model 2	0.3553	0.4432	−0.1678	0.7697
Model 3	0.5514	0.2963	−0.0617	0.9094
Exercise				
Model 1	0.8546	0.1051	−0.5483	0.2691
Model 2	0.6692	0.2043	−0.5350	0.2888
Model 3	1.1187	0.0290	−0.1482	0.7601
Home remedies				
Model 1	1.6779	0.1068	−2.5061	0.0113
Model 2	1.6556	0.1134	−2.4270	0.0157
Model 3	1.6605	0.0989	−2.0310	0.0358

Note: HRQoL = health-related quality of life. OTC = over-the-counter.

Model 1 Unadjusted with only nonprescribed therapies and month effects.

Model 2 M1 plus adjusted for baseline age, gender, marital status, race, education, income, total chronic conditions, smoking status, and alcohol use.

Model 3 M2 plus adjusted for time varying number of symptoms.

* Regression coefficients are corresponding to users of each nonprescribed therapy. The reference categories are nonusers of each nonprescribed therapy.