Articles

Using Alternative Therapies to Manage Chronic Illness Among Older Adults: An Examination of the Health Context, Predisposing and Enabling Processes

Andrew V. Wister, Minda Chittenden, Bonnie McCoy, Kelly Wilson, Trasey Allen, and Melanie Wong
*Simon Fraser University at Harbour Center**

RÉSUMÉ

Cet article traite de l'utilisation de médecines douces pour gérer une maladie chronique chez les adultes âgés qui souffrent d'au moins une des trois affections suivantes: arthrite, maladie du cœur et hypertension. En tirant des conclusions de la littérature reliée à la santé, l'accent est mis sur le contexte de la maladie, les facteurs prédisposants et plusieurs facteurs qui semblent inciter certaines personnes à utiliser des médecines douces. Des données de départ (n = 87) tirées d'une étude effectuée en 1995–96 à Vancouver, Canada (North Shore Self-Care Study) ont été utilisées. On a analysé deux variables dépendantes en utilisant des techniques de régression logistique – la première se fonde sur une question globale concernant l'utilisation des médecines douces (les herbes médicinales, l'acupuncture, les massages thérapeutiques, etc.) pour gérer un état chronique et la deuxième porte sur une question plus spécifique relative à la méditation ou la prière. Les résultats de la première analyse montrent que le fait d'être plus jeune, de souffrir d'arthrite par rapport à l'hypertension, de comorbidité, de consommer moins de médicaments, d'avoir des revenus plus bas, de lire sur son état chronique et d'agir sur soi à partir de ses lectures sont associés à l'essai des médecines douces. Les conclusions de la deuxième analyse montrent que le fait d'être une femme, plus jeune, célibataire, d'avoir un état plus grave et une maladie plus longue, le lien entre des niveaux modérés d'entraide et le nombre de confidents, incitent vraisemblablement à avoir recours à la méditation et à la prière. Les répercussions de ces résultats sont abordés sous l'angle de leur signification théorique et du degré de pertinence de la complémentarité de la médecine conventionnelle et non conventionnelle.

ABSTRACT

This paper examines use of alternative therapies to manage a chronic illness among older adults with at least one of three major conditions: arthritis, heart disease, and hypertension. Drawing from developments in the health utilization literature, a focus is placed on the illness context, predisposing factors, and several factors deemed to enable persons to use complementary medicine. The baseline data (n = 879) from the 1995–96 North Shore Self-Care Study conducted in Vancouver, Canada were used for this study. Two dependent variables were analysed using logistic regression techniques – the first is based on a comprehensive question about using alternative therapies (such as herbal remedies, acupuncture, massage therapy, etc.) to manage a chronic condition; and the second uses a more specific question pertaining to meditation or praying. The results from the first analysis show that being younger, suffering from arthritis compared to hypertension, comorbidity, taking fewer medications, lower income, reading on the chronic condition, and the interaction between reading and illness self-efficacy are associated with trying alternative therapies. The findings for the second analysis show that being female, being younger, and not married, as well as reporting a more serious condition, illness duration and the interaction between having moderate levels of mutual aid and number of confidants result in a greater likelihood of trying meditation/prayer. Implications of these results are discussed in terms of their theoretical import, and their relevance for the degree to which unconventional and conventional medicine are complementary.

Introduction

The field of self-care has proliferated in recent years in recognition of the fact that individuals are becoming more involved in all aspects of their health care (Ory & Defriese, 1998). Self-care has been defined as a continuum of caring for the self to enhance health, prevent disease, evaluate symptoms and restore health, which is organized by the perceptions, decisions and options available to each individual (Dean & Kickbusch, 1995, p. 36). One group of self-care practices that has received considerable attention has been what is termed "alternative therapies," also known as "complementary medicine" and "unconventional medicine" (Eisenberg, Kessler, Foster et al., 1993). These terms encompass a range of alternative practices, including manual healing (such as acupuncture, massage, and chiropractic); herbal medicine (such as ginkgo, ginseng, St. Johns' Wort); vitamin therapy; mind/body control (such as meditation or praying); bioelectromagnetic applications; and various pharmacological treatments (see OAM–NIH Classification of Alternative Medicine Practices, 1999). Although the efficacy of many of these therapies remains controversial, it is clear that they are becoming popular self-care practices, and ones for which individuals appear to be willing to pay. In fact, it is estimated that the cost of unconventional medicine in the United States equals the annual expenditures on hospitalization by individuals (Eisenberg et al., 1993).

The apparent rise in alternative therapy use is especially significant given population aging, increased life expectancy, and the concomitant expansion in the numbers of individuals managing chronic illness, which may magnify current patterns of use. Yet, little is known about how and why people are led to try alternative health practices, especially linking patterns of use for specific types of alternative therapies to specific types of health problems. Indeed, no studies have explicitly examined these issues for older populations managing a chronic illness. In response to these research gaps, this paper provides an exploratory study of alternative therapy use among older adults aged 50 and over who have been diagnosed with one of three common chronic conditions – arthritis, heart disease, and hypertension as part of a study of self-care and aging. The purpose of the present research is to better understand why alternative therapy is integrated within an illness management system, including the elaboration of relationships between the formal medical system and this type of self-care behaviour.

Review of Literature

The Prevalence and Cost of Alternative Therapy Use

The use of alternative therapies in the general population appears to be on the rise in many nations. A 1992 national survey conducted in the US revealed a prevalence rate of alternative therapy use in the previous year of approximately 34 per cent, and about one-third (36%) of these individuals visited providers for unconventional therapy (Eisenberg et al., 1993). These "unconventional" practices included: relaxation, chiropractic, massage, imagery, spiritual healing, commercial weight-loss programs, lifestyle diets, herbal medicines, megavitamin therapy, self-help groups, energy healing, biofeedback, hypnosis, homeopathy, acupuncture, folk remedies, exercise, and prayer. The *Canada Health Monitor* found that one in five Canadians had used an alternative therapy within the preceding six months (*CMAJ*, 1991). Furthermore, data from the 1993/94 Canadian National Population Health Survey indicates that about 15 per cent of adult Canadians have consulted an alternative health practitioner in the year prior to the survey (Millar, 1997). European statistics show rates ranging from 20 per cent of the population in the Netherlands to 49 per cent in France (Fisher & Ward, 1994). And in Australia, a high prevalence rate was also found; 48.5 per cent of South Australians used at least one medically prescribed alternative medicine and one-fifth visited an alternative practitioner in the preceding year (MacLennan, Wilson, & Taylor, 1996). The variability of the rates is likely dependent on health insurance coverage, availability and accessibility of various therapies, normative and belief systems, advertising, acceptability among the medical professions, and other population characteristics.

Specific studies of chronically ill populations indicate that the use of alternative therapies is even more prevalent in this group than in the general population. Surveys of arthritis and rheumatism sufferers using alternative therapies have reported prevalence rates ranging from 82 to 94 per cent (Boisset & Fitzcharles, 1994; Kestin, Miller, Littlejohn, & Wallgrist, 1985; Kronenfeld & Wasner, 1982). In their Montreal study of 235 rheumatology patients, Boisset and Fitzcharles (1994) found that, over a 12-month period, 54 per cent used over the counter products, 39 per cent used prayer, relaxation and meditation, and 13 per cent had visited an alternative practitioner. In the 1993/94 National Population Health Survey, the number of chronic illnesses reported was positively associated with the use of alternative therapies. Prevalence increased from 9 per cent in the population reporting no chronic disease to 26 per cent of subjects reporting the presence of three or more chronic conditions (Millar, 1997).

The economic costs associated with alternative medicine are also noteworthy, both to the consumer and to the public health providers. In England and Wales, it was estimated that the public spent between £150 million and £450 million on "unconventional" treatments from a professional, with an additional £250 million spent on supplements and £100 million on natural remedies (Richmond, 1991). In an Australian study, it was estimated that $AU621 million (Australian dollars) were spent for alternative medicines and $AU309 million for alternative therapists, per annum (MacLennan et al., 1996). Extrapolating their results to the entire population, Eisenberg et al. (1993) estimated that Americans spent a total of $13.7 billion, with $10.3 billion paid by the consumer (Eisenberg et al., 1993). This was compared with the $12.8 billion spent by the consumer, annually, on all hospitalizations in the United States. Canadian costs have yet to be calculated. Thus, rates of alternative therapy use are significant, especially among persons with a chronic illness; and these patterns have enormous economic implications.

Major Correlates of Alternative Therapy Use

Studies of correlates of alternative therapy use have met with inconsistent findings. MacLennan et al. (1996) found that users of alternative therapies were more likely to be women, better educated, to drink more, be of normal body weight, and employed compared to non-users. Using data from the 1994–95 National Population Health Survey, it was determined that alternative health care providers were utilized more often by persons of higher education, higher income, specific regions (British Columbians had the highest rate), and those suffering a higher number of chronic conditions (*CMAJ*, 1997). Boisset & Fitzcharles (1994) found that higher income and French-speaking Quebecers used more bought products, but found no other differences. Comparisons across surveys, however, are complicated by: 1) differing sample sizes; 2) variation in the type/definition of alternative therapy use; 3) differing time periods, regions or countries; and 4) varying characteristics of the sample group in terms of chronic disease type(s), age, etc.

Reasons for Alternative Therapy Use
Preliminary research suggests that people seek out alternative therapies for a number of reasons (Kelner & Wellman, 1997). One of these is dissatisfaction or scepticism with conventional medicine (Furnham & Forey, 1994; Sutherland & Verhoef, 1994; Verhoef, Sutherland & Brkich, 1990). Eisenberg et al. (1993) estimate that about 25 per cent of people who see their medical doctor for a serious problem also use alternative therapies in combination with allopathic (traditional) medicine.

Although some medical practitioners refer patients to alternative therapists, one of the most commonly cited reasons for seeking alternative medicine has been the perceived failure of allopathic medicine in treating pain and other symptoms (Marshall et al., 1990; Moore, Phipps, & Marcer, 1985; Vincent & Furnham, 1996). Moore et al. (1985) found that 22 per cent of subjects seeking assistance at the Centre for Alternative Therapies in the United Kingdom were referred by a medical practitioner, but that 54 per cent had noted that the main reason for attending was due to the failure of conventional medicine. Marshall et al. (1990), who interviewed practitioners in New Zealand, found that 68.7 per cent of the doctors referred patients to alternative therapists and that about 39 per cent cited failure of conventional medicine as the reason for their referral.

In a similar vein, other researchers suggest that alternative therapy use is an attempt by individuals to increase their control over health problems (Montbriand & Laing, 1991; Murray & Shepherd, 1993), in part, due to the anxiety produced by unsuccessful treatments of chronic disease using medications and other forms of allopathic medicine. However, while scepticism, the need for autonomy and control, and dissatisfaction with conventional medicine may be sufficient motivators, people also require information on uses, sources and costs of alternative therapies, either through reading on the subject, via information channels, or through their support networks. Additionally, use of alternative therapies may be linked to people's health orientation (Astin, 1996). An extension of our understanding about the pathways through which health beliefs and health experiences affect alternative therapy use therefore requires consideration of a constellation of decision-making elements (Kart & Engler, 1994; Wister, 1995).

An Application of the Andersen–Newman Model
The original Andersen–Newman (Andersen & Newman, 1973) model, and the revised model (Andersen, 1995), have been applied extensively to a variety of health utilization behaviours (Andersen, 1995; Chappell & Blandford, 1987; Fleming, Giachello, Andersen, & Andrade, 1984; Wister, 1992; Wolinsky, 1978). Drawing from this conceptual frame, we can organize the socio–demographic correlates, health factors, reasons for alternative therapy use, and other key explanatory variables according to whether they are *predisposing*, *need* or *enabling* factors. This provides a means whereby prior research on correlates of use and discussion of substantive issues can be transformed into the development of specific hypotheses that can be tested, compared, and placed within the context of a self–management decision model.

Predisposing Factors -- Predisposing factors are deemed antecedent to the onset of illness and influence the proclivity of an individual to use health services, or in this case, alternative therapies. Gender, age, marital status, education, and health beliefs are considered to predispose an individual to use alternative therapies (Boisset & Fitzcharles, 1994; MacLennan et al., 1996). In line with correlational studies, *we hypothesize that being female, being younger, and of higher education will predispose a person to trying alternative therapies* (*CMAJ*, 1997; MacLennan et al., 1996). While we have no formal hypothesis for marital status, we explore its impact on patterns of alternative therapy use.

Need Factors -- Need factors pertain to the objective and subjective health states of individuals, which are anticipated to increase demand for health services, including the likelihood of trying alternative therapies (Gray, 1985; Sutherland & Verhoef, 1994). Illness dynamics may lead persons to seek out alternative therapies to manage their condition, or as a response to dissatisfaction with aspects of the formal health system in dealing with their health problems (Murray & Rubel, 1992; Sutherland & Verhoef, 1994; Vincent & Furnham, 1996). It is expected that persons with chronic conditions that are typically associated with more overt symptoms, such as presentation of pain and limited activities of daily living, would demonstrate a propensity to use more unconventional coping strategies than those with less disruptive symptoms (McDonald-Miszczak, Wister & Gutman, 2001). In this study, three major chronic disease types have been examined, which can be ordered in terms of degree of overt symptoms. Persons with arthritis were expected to present more symptoms disruptive of daily activities than those reporting hypertension. Those reporting heart disease as their most serious chronic condition were expected to fall between the former two. For example, persons with angina may present pain and discomfort, but only upon physical exertion. Among persons with more than one condition, co-morbidity, or the number of other chronic conditions, is expected to be positively associated with alternative therapy use, given that multiple conditions complicate and exacerbate problematic symptoms of chronic disease. Similarly, persons who perceive their main condition as more serious would also be more likely to use complementary medicine. In addition, it is anticipated that, the longer the duration of the major chronic illness (i.e., time since diagnosis), the greater the tendency to engage in alternative responses to health (Gray, 1985). Thus, *we hypothesize that chronic illnesses with more overt symptoms, comorbidity, higher perceived seriousness of the illness, and longer duration of the illness will lead to a greater likelihood of alternative therapy use.*

On one level, doctor visits and prescription medicines may be deemed to be indicators of need, because persons tend to seek treatment when experiencing symptoms of chronic disease. But on another level, they also directly measure involvement with the formal health care system. Previous studies have established that persons who use alternative therapies tend to be concurrently under the care of a doctor (e.g., Eisenberg et al., 1993; Northcott & Bachynsky, 1993). However, it is not clear whether past utilization of the formal system affects current use, whether this association holds when accounting for other factors affecting patterns of use, nor whether the same relationship is apparent for prescription drug use. Given the controversy surrounding the complementary nature of allopathic and unconventional medicine (Lewith, 1997), we will *explore* whether greater formal care use facilitates or inhibits the use of alternative therapies through an examination of the impact of past doctor visits and medication use on current use of alternative therapies.

Enabling Factors -- According to Andersen (1995), enabling factors are conditions affecting access to alternative therapies. Consistent with other research, *greater income is expected to be associated with trying alternative medicine* (Wolinsky & Johnson, 1991; *CMAJ*, 1997). Advancements of behavioural models applied to older chronically-ill populations have led to an expansion of the enabling component in a number of ways that one would anticipate are important for alternative therapy use. These include: support from confidants embedded within the support network, contact with other individuals with the same problem, current levels of confidence/control or self-efficacy that one has in dealing with health problems, and sources of information, such as reading on the subject (Bandura, 1986; Lorig & Holman, 1989; Wister, 1992; Zimmer & Chappell, 1994).

The social support network of individuals has long been recognized as a principal facilitator for a variety of health behaviours (Cohen & Syme, 1985). In addition, research has identified mutual aid as an important form of support that is shared among persons experiencing the same illness (Romeder, 1999). *It is anticipated that receipt of support through confidants, and interacting with persons suffering from the same illness (mutual aid), enables the use of alternative therapies.* Furthermore, research on self-management of chronic disease (see for example, Lorig & Holman, 1989; Clark et al., 1991) has demonstrated that self-efficacy is an important factor affecting health behaviour. Furthermore, a major reason for seeking alternative medicine is to increase control over one's health (Montbriand & Laing, 1991; Murray & Shepherd, 1993). *It is expected that lower levels of self-efficacy will be associated with*

alternative therapy use. Given the growth in popular self-help and self-care literature, and access to information via the Internet, reading about one's illness condition would likely expose the person to knowledge about alternative therapies. This comprises an important facilitator in learning where and how to obtain and try alternative therapies, especially those that are less known. *It is hypothesized that reading on the subject will be associated with the use of unconventional medicine to manage a chronic condition.* We also examined interactions between all four of these enabling factors because of the likelihood of simultaneous influences of processes deemed to facilitate use. For example, mutual aid combined with reading about an alternative type of therapy may encourage use; and a desire to increase control over one's health in combination with reading on the subject, or social support, may also act interactively.

Methods

The Sample

The first wave of the North Shore Self-Care Study, conducted in 1995–1996, was used in this research. Using random digit dialling, trained interviewers completed telephone surveys with 904 older adults aged 50 and over living in the municipalities of North and West Vancouver, British Columbia, Canada. While we deem persons 50 and over as "older adults," it is recognized that both middle-aged and elderly persons are included in the sample. The response rate to our request for participation among eligible subjects for this sample was 72.2 per cent and is consistent with telephone surveys. Eligibility based on the illness criterion required respondents to have been professionally diagnosed with one of four major chronic illnesses, including: arthritis or rheumatism, heart disease, hypertension and stroke. The small number (25) of persons with stroke have been removed, resulting in a sub-sample of 879 persons used in the present analysis. Heart disease included: arrhythmia (irregular heart beat), angina, myocardial infarction, congestive heart failure, valvular disease, and any other diagnosed heart condition. Hypertension was included because it tends to be linked with fewer overt symptoms compared to the other types. Since the purpose of the survey was to understand illness management behaviours, respondents (54 per cent) with more than one of these chronic conditions were placed in the chronic condition category that they self–reported as affecting them most. In keeping with this theme, the majority of questions about managing the chronic illness focused on the major condition.

Descriptive statistics show that the sample is comprised of 417 (47.4%) persons with arthritis/rheumatism, 229 (26.1%) with a heart problem, and 233 (26.5%) with hypertension. The average age is 69.3, with a range between 50 and 94. The gender breakdown includes 513 (58.4%) females and 366 (41.6%) males. Also, 340 (38.7%) live alone, while 538 (61.3%) live with a spouse and/or others. The socio-economic profile of the sample shows that the North Shore sample is better educated, but similar in income level compared to the general Canadian population aged 50 and over.

Measurement

Dependent Variables -- Respondents were asked several questions about a variety of self–care behaviours *specifically* used to manage their chronic condition. Two of these questions asked about alternative therapies – a general question and one specific to prayer/meditation. These were measured using yes/no responses to the following question predicated by the opening statement: "People try various things to improve or cope with their condition.". . . "Which of these are you doing now?" The two were: 1) try alternative therapies, such as herbal remedies, acupuncture, massage, etc; and 2) try meditation or praying. Of the total sample (n = 879), 133 (15.1%) responded in the affirmative to the first question about alternative therapy use; while 251 (28.6%) stated that they had tried meditation or praying to cope with their chronic condition. Examination of rankings of specific types of alternative therapies indicates that herbal, massage, and acupuncture were the most prevalent, but that many others are also used, albeit at very low rates. In addition, meditation/prayer is considered to capture one type of mind–body experience that falls within the broad definition of alternative therapies. Overall, it is argued that these two measures encapsulate important dimensions of alternative therapy use, albeit, some of these are combined rather than measured separately as would be the ideal.

Table 1: Frequency distributions, range, means and standard deviations for all variables*

Dependent Variable	Categories	Frequency	Percentage
Alternative Therapies	Doing Now	133	15.1
	Not Doing Now	745	84.7
	Missing	1	0.1
	Total	**879**	**100.0**
Meditation/Prayer	Doing Now	251	28.6
	Not Doing Now	625	71.1
	Missing	3	0.3
Categorical Independent Variables			
Gender	Male	366	41.6
	Female	513	58.4
Marital Status	Not Married	390	44.4
	Married/Common Law	488	55.5
	Missing	1	0.1
Education	Some Sec. or Less	128	14.6
	Completed Secondary	218	24.8
	Post-Secondary	529	60.2
	Missing	4	0.5
Income	<$20,000	194	22.1
	$20,000–$49,999	307	34.9
	$50,000–$69,999	142	16.2
	$70,000–$99,999	68	7.7
	$100,000 +	54	6.1
	Missing	114	13.0
Most Serious Chronic Condition	Arthritis	417	47.4
	Heart Disease	229	26.1
	High Blood Pressure	233	26.5
Perceived Seriousness	Not At All Serious	198	22.5
	Slightly Serious	255	29.0
	Moderately Serious	349	39.7
	Extremely Serious	74	8.4
	Missing	3	0.3
Mutual Aid	Daily–Every 2 Weeks	69	7.8
	Once/Month–Few/Year	311	35.4
	Never	499	56.8
Reading on Subject	No	269	30.6
	Yes	607	69.1
	Missing	3	0.3

Interval Independent Variables	Missing Cases	Range	Mean	Standard Deviation
Age	4	50–95	69.30	0.81
Comorbidity	0	0–7	1.56	1.37
Years Since Diagnosis	0	0.1–83.6	12.40	11.73
Number of Doctor Visits (last 3 months)	0	0–30	2.57	2.77
Number of Prescriptions	0	0–21	2.37	2.21
Number of Confidants	0	0–50	4.20	3.99
Illness Self Efficacy	0	9–55	36.45	8.24

*   Frequencies and percentages are provided only for categorical variables.

Independent variables -- A total of 15 independent variables were included into the analysis under the categories of predisposing, need, and enabling factors. Table 1 shows the frequency distributions for the categorical independent variables, and selected condescriptive statistics for continuous variables, as well as missing values. The first set of factors includes the four predisposing factors: gender, age, marital status,

and education. Gender was divided into males and females. Participants' chronological age at the time of the survey was used. Marital status was dichotomized into not married and married/common-law. Level of education was collapsed into a three-point scale with the categories: some secondary or less, completed secondary, and post–secondary education.

The second set of variables encompassed six measures of need. The type of chronic illness included: arthritis/rheumatism, heart disease, and high blood pressure (hypertension). The number of co-morbidities experienced by participants, in addition to the major chronic condition affecting their lives, was calculated by counting the total number of reported "other health problems" as listed, including: asthma/emphysema, anxiety, depression, cancer, diabetes, neurological disease, Alzheimer's disease, osteoporosis, vision problems, hearing problems, and other problems. Participants were also asked how serious they perceived their condition to be (ranging from not at all serious to extremely serious). Duration of the main chronic condition (time since diagnosis) was expressed in years and proportions of years, based on the question: "when were you first professionally diagnosed (by a doctor, nurse, physiotherapist etc.) with your specific condition". Number of doctor visits was measured by the number of visits within the last three months. Also, the number of prescriptions currently being taken was used to measure prescription drug use.

The final grouping of variables included five enabling factors – income, confidants, mutual aid, self-efficacy, and reading on the subject of alternative therapy. Income was measured using reported total household income based on a five point scale: less than $20,000; $20,000–$49,999; $50,000–$69,999; $70,000–$99,999; and $100,000+. Confidants were identified in terms of the total number of persons with whom one can confide about personal matters. Mutual aid was based on the question: "About how often do you discuss your condition with another person who also has (arthritis/heart disease/high blood pressure)" and was divided into three categories, daily–every two weeks–once/month–few times a year, and never. Also, each specific illness type had a self-efficacy scale. We used Lorig et al.'s (1989) Arthritis Self-efficacy Scale to measure arthritis self-efficacy. This scale is comprised of 11 questions pertaining to the participants' confidence in controlling selected aspects of their condition (see Appendix 1). In modifying the scale for the heart and hypertension groups, we removed a few of the arthritis-specific questions. In addition, some of the questions were slightly reworded for the heart problem and hypertension groups in order to be relevant to their condition. Subjects with arthritis, heart dis-

ease, and high blood pressure answered 11, 9, and 8 questions, respectively, to measure illness self-efficacy. Each response was rated on a five-point Likert scale ranging from 1 (not confident at all) to 5 (totally confident). Since the number of questions posed differed according to the type of illness, a proportional score was used (total response score/number of scale items). Cronbach's Alphas were computed for each scale: arthritis self-efficacy = .89 (consistent with Lorig's research); heart problem self-efficacy = .84; and hypertension self-efficacy = .74, indicating good reliability. Reading about the chronic condition was measured by a yes or no response to the question: "Once diagnosed with (arthritis/disease/high blood pressure), did you do some reading on the subject?". Although current reading on the main chronic illness was also available, we chose the measure tied to diagnosis time in order to sequentially prioritize this variable. The mean length of time since diagnoses for the three illness types are as follows: arthritis – 12.7 years; heart disease – 10.3 years; and hypertension – 12.6 years.

Missing Data -- Since there were very few missing cases (between 0 and 4 cases) for all variables except for *income*, we used either mean or modal substitution to recode these cases for continuous and categorical variables, respectively. The large number (114, 15%) of missing data for income were substituted using income distributions across three other variables. We used three age groups (50–64, 65–74, and 75+), two sex groups, and three education groups (same as in Table 1) to redistribute the missing cases for income. This results in more accurate substituted missing data because of the associations between income and these three variables, and does not seriously decrease the standard deviation of the derived income variable.

Logistic Regression Methods

Logistic regression is a statistical technique that has been developed to perform multivariate analyses using a dichotomous response variable with various degrees of skewness (Morgan & Teachman, 1988; DeMaris, 1995; Menard, 1995). The betas generated by logistic regression are maximum likelihood estimates for the linear regression of the latent dependent variable in log form. A simple transformation of the beta coefficient $\exp(B_k)$ produces the estimated odds ratio for persons who are a unit apart on X_k (for continuous variables), or compared to a reference category (for categorical variables), after statistically controlling for all other predictors in the model (DeMaris, 1995).

The logistic regression beta coefficient, its level of statistical significance, an odds ratio, and the model chi-square value are presented in this analysis. The logistic regression coefficient represents the change in the

log odds of using alternative therapies (compared to not using them) for a one–unit change in an explanatory variable, while statistically controlling for all others (Menard, 1995). Since the parameter estimate is difficult to interpret as a log, it can be easily converted into an arithmetic odds ratio, using the formula [exp(B)]. The conversion is the estimated odds ratio for those who are a unit apart on a given explanatory variable, after other variables in the model have been statistically controlled. In this study, it is the probability of engaging in alternative practices for each increment of an interval variable or for one category of a categorical variable compared to the reference category. A positive coefficient results in an odds ratio ranging between 1 and infinity, whereas a negative coefficient ranges between 1 and zero (but never reaching zero). For example, an odds ratio of 2.0 for a categorical variable (e.g., gender) indicates that the probability of practising alternative therapies is twice as large for the specified category of that variable (e.g., females) compared to the reference category (e.g., males), while statistically controlling for all other explanatory variables (DeMaris, 1995). The model chi-square value is the improvement that the proposed model makes over the model of independence, that is, a larger chi-square indicates a greater improvement in fit to the data (Morgan & Teachman, 1988). In addition, we examine all first order interaction effects between the four enabling factors – number of confidants, mutual aid, illness self-efficacy and reading on the illness.

Results

Logistic Regression for Alternative Therapy Use
The logistic regression results for alternative therapy use are shown in Table 2. A main effects model and an interaction model have been estimated, both of which result in statistically significant Model Chi Square statistics (71.94, $p < .001$ and 80.23, $p < .001$, respectively). Since the inclusion of the interaction terms can cause instability in the regression coefficients for the main

effects, results from the two analyses are presented separately. Six variables in the main effects model are found to be statistically significant. An inverse association between alternative therapy use and age is supported. The odds of using alternative therapies to manage a chronic condition are .97 lower for each increment or year in age, controlling for all other variables in the equation. The other three predisposing variables (gender, education and marital status) were not found to be statistically significant. Three of the six need factors, illness type, co-orbidity, and number of prescription medicines, demonstrated statistically significant associations with alternative therapy use. The odds of using alternative therapies is almost half as low (odds ratio = .45) for the hypertension group as for the arthritis group. No association is supported for the heart problem–arthritis comparison. However, the likelihood of use is increased by a factor of 1.23 times higher for each additional co-morbid condition. In addition, use of alternative therapies is inversely associated with prescription drug use. The odds of use are .84 lower for each prescriptive medication taken. Perceived seriousness, duration of condition, and number of doctor visits result in relationships that are not statistically significant. Two of the five enabling factors exhibit statistically significant associations with alternative therapy use. The odds of use are .60 and .32 lower for the $20,000–$49,999 and the $100,000+ income groups respectively compared to the less than $20,000 group. Furthermore, the odds of alternative therapy use are almost twice (odds ratio = 1.89) as high for persons who read about their chronic illness after being diagnosed compared to those who do not.

Turning to the interaction model, only one of the eight interaction terms was found to be associated with use of alternative therapies. Persons who read about their condition and who report higher self-efficacy are more likely to use alternative therapies (odds ratio = 1.07).

Table 2: Logistic regression for alternative therapies

Full Mode

	B	S.E.	Exp (B)
Predisposing Variables			
Gender (ref = Male)			
Female	.37	.23	NS
Age	−.03**	.01	.97
Education (ref = Some Sec. or Less)			
Completed Secondary	−.08	.33	NS
Post-Secondary	−.15	.29	NS
Marital Status (ref = Not Married)			
Married/Common Law	−.22	.21	NS
Need Variables			
Illness Type (ref = Arthritis)			
Heart Disease	−.55	.29	NS
Hypertension	−.81**	.30	.45
Comorbidity	.21*	.09	1.23
Perceived Seriousness (ref = Not At All)			
Slightly Serious	.01	.30	NS
Moderately Serious	.31	.28	NS
Extremely Serious	.26	.43	NS
Duration of Condition	−.003	−.10	NS
Number of Doctor Visits	.06	.03	NS
Number of Prescription Medications	−.17**	.06	.84
Enabling Variables			
Income (ref = < $20,000)			
$20,000–49,999	−.51*	.25	.60
$50,000–69,999	−.10	.29	NS
$70,000–99,999	.33	.37	NS
$100,000 +	−1.12*	.57	.32
Number of Confidants	.03	.02	NS
Mutual Aid (ref = Never)			
Daily–Every 2 Weeks	−.52	.38	NS
Once Per Month/Few Times Year	−.20	.22	NS
Illness Self-Efficacy	.009	.01	NS
Reading on Subject	.64**	.24	1.89
Constant	−.40	.99	
Model Chi Square	71.94***		

Interaction Model

Interaction Terms	B	S.E.	Exp (B)
Reading x Number of Confidants	−.02	.05	NS
Reading x Self-Efficacy	.07**	.03	1.07
Reading x High Mutual Aid	.65	1.23	NS
Reading x Moderate Mutual Aid	.38	.59	NS
High Mutual Aid x Number of Confidants	−.68	.09	NS

Table 2: Logistic regression for alternative therapies continued on the following page

Table 2: Logistic regression for alternative therapies continued

Moderate Mutual Aid x Number of Confidants	.03	.05	NS
High Mutual Aid x Self-Efficacy	−.52	.05	NS
Moderate Mutual Aid x Self-Efficacy	−.02	.03	NS
Constant	.79	1.14	
Model Chi Square	80.23***		

*p <.05; **p<.01; ***p<.001

B = Parameter Estimate; S.E. = Standard Error; Exp (B) = Odds Ratio

Sec = Secondary; ref = Reference Category

Note: Parameter estimates are not shown for the main effects included in the Interaction Model because of instability in some of the coefficients.

Logistic Regression for Meditation/Prayer

Both the full main effects model and the interaction model also result in statistically significant Model Chi Square statistics (69.18, *p* < .001, and 79.50, *p* < .001, respectively) for the meditation/prayer analysis. As shown in table 3, a total of six variables predict this type of illness management strategy. Three of the four predisposing factors, age, gender and marital status, exhibit statistically significant associations. The likeli-

hood of engaging in meditation or prayer to manage a chronic condition is higher (odds ratio = 1.77) for females than for males. The probability of this type of coping behaviour is lower for each year of age (odds ratio = .98) and is lower for married (odds ratio = .64) compared to non–married older adults. No support was found for an association between education and alternative therapy use.

Table 3: Logistic regression for meditation/prayer

	Full Model		
	B	**S.E.**	**Exp (B)**
Predisposing Variables			
Gender (ref = Male)			
Female	.57**	.18	1.77
Age	−.02*	.01	.98
Education (ref = Some Sec. or Less)			
Completed Secondary	−.22	.26	NS
Post–Secondary	−.18	.23	NS
Marital Status (ref = Not Married)			
Married/Common Law	−.45**	.17	.64
Need Variables			
Illness Type (ref = Arthritis)			
Heart Disease	.34	.22	NS
Hypertension	−.09	.23	NS
Comorbidity	.07	.07	NS
Perceived Seriousness (ref = Not At All)			
Slightly Serious	−.01	.24	NS
Moderately Serious	.43*	.22	1.53
Extremely Serious	.71*	.33	2.04
Duration of Condition	.02**	.01	1.02
Number of Doctor Visits	.005	.03	NS
Number of Prescription Medications	−.006	.04	NS

Table 3: Logistic regression for meditation/prayer continued

Enabling Variables			
Income (ref = < $20,000)			
$20,000–49,999	−.11	.20	NS
$50,000–69,999	.25	.24	NS
$70,000–99,999	−.36	.34	NS
$100,000 +	−.51	.39	NS
Number of Confidants	.02	.02	NS
Mutual Aid (ref = Never)			
Daily–Every 2 Weeks	−.28	.31	NS
Once Per Month/Few Times Year	−.20	.17	NS
Illness Self–Efficacy	−.002	.01	NS
Reading on Subject	.29	.18	NS
Constant	−.20	.79	
Model Chi Square	69.18***		

	Interaction Model		
Interaction Terms			
Reading x Number of Confidants	−.01	.05	NS
Reading x Self-Efficacy	−.002	.02	NS
Reading x High Mutual Aid	.29	.97	NS
Reading x Moderate Mutual Aid	−.53	.39	NS
High Mutual Aid x Number of Confidants	.09	.07	NS
Moderate Mutual Aid x Number of Confidants	.09*	.04	1.10
High Mutual Aid x Self-Efficacy	−.07	.04	NS
Moderate Mutual Aid x Self-Efficacy	−.01	.02	NS
Constant	.29	.92	
Model Chi Square	79.50***		

*p <.05; **p<.01; ***p<.001

B = Parameter Estimate; S.E. = Standard Error; Exp (B) = Odds Ratio

Sec = Secondary; ref = Reference Category

Note: Parameter estimates are not shown for the main effects included in the Interaction Model because of instability in some of the coefficients.

Among the six need factors, perceived seriousness and duration of condition were found to be important. The likelihood of meditating or praying is higher for persons perceiving their condition to be moderately serious (odds ratio = 1.53) and extremely serious (odds ratio = 2.04) compared to not at all serious. In addition, the odds of engaging in this style of coping behaviour increased (odds ratio = 1.02) for each year of illness duration. However, relationships with illness type, co-morbidity, number of doctor visits and number of prescription medications were not supported.

Surprisingly, none of the five enabling factors showed statistically significant associations with illness management by means of meditation/prayer. However,

persons with combinations of moderate levels of mutual aid and a higher number of confidants are more likely to mediate or pray to cope with their condition.

Discussion

Alternative therapy use has received increasing attention as one primary form of self-care engaged by persons with a chronic illness, which is typically only part of a comprehensive and dynamic illness management system (Clark et al., 1991; Clark et al., 2000; Wister & Dean, 1998). This phenomenon is particularly relevant in the face of accelerated population aging projected for the first several decades of the new millennium. Our substantive focus entailed

chronic illness management among older adults aged 50 and over because of their increased risk of illness onset. Drawing from the Andersen–Newman Model, this research investigated sets of predisposing, need and enabling factors affecting two measures of alternative therapy use – a broad measure of use and one that focuses on prayer and meditation. The principal research questions guiding this research are whether and to what degree the propensity to use alternative therapies as an illness response is affected by predisposing factors, dimensions of need embodied in the illness context, involvement with the formal medical system, and facilitation through enabling components. And further, the question as to whether the use was affected by an expanded set of enabling factors deemed to be important was addressed. These factors included: supportive ties, self-efficacy, and reading information sources, as well as their interactions.

Approximately 15 per cent of the older adult subjects (n = 879) in the North Shore Self-Care Study (NSSCS) used alternative therapies specifically to manage their chronic condition, such as herbal remedies, massage, acupuncture, and other unconventional medicine, and almost 29 per cent used meditation or prayer as an illness management strategy. These rates are similar or a little lower than those in other studies. For example, the 1993/94 National Population Health Survey shows that about 15 per cent of adult Canadians reported that they had consulted an alternative health practitioner in the year prior to the survey (Millar, 1997). And in the United States, Eisenberg et al. (1993) found that 34 per cent of adults had reported using alternative therapies in the previous year. The patterns of use identified in our study reinforce that a substantively important proportion of individuals adopt unconventional medical practices in their illness management. For comparative purposes, it was also found in our study that rates of traditional lifestyle self-care practices specifically used to manage their chronic illness, such as exercise, diet and weight change, ranged between 50 and 70 per cent, whereas self-help group participation was approximately 10 per cent.

Multivariate findings based on the logistic regression analyses establish that the use of alternative therapies is affected by measures of predisposing, need and enabling factors. The probability of use of unconventional medicine was shown to be higher among persons who report co-morbidity, adults who read on the subject of their illness, and is altered by the interaction of reading and higher levels of illness self-efficacy. A lower likelihood of use was found among persons of higher age, those persons reporting hypertension as their major chronic illness (compared to arthritis/rheumatism), those taking more medications, and

those reporting annual household incomes of $20,000–$49,999 and over $100,000 compared to those of low income (under $20,000). Only the income result is contrary to the hypothesized association.

With regard to prayer/meditation, predisposing and need factors appear to be most important in affecting the probability of use. Being female, perceiving one's condition as more serious and longer duration of the chronic condition result in a greater tendency to try these methods of coping. Lower rates are observed for persons of higher age, and among persons who are married/common law compared to those who are unattached. The only enabling effect was found for the interaction of moderate levels of mutual aid coupled with higher numbers of confidants.

These results indicate that age is an important predisposing factor affecting the tendency to engage in alternative therapies, and moreover, that rates of use decrease among older persons. However, it is not clear whether it is an age, period or cohort effect that results in people of older ages exhibiting lower rates of use. It is likely that the alternative therapy movement has targeted younger and middle-aged persons, and that the medical orientation of older persons is more traditional, relying more on opinions of doctors than information or other sources. In addition, unattached women in the pre-retirement ages appear to be the most likely candidates to manage their chronic illness using meditation techniques or prayer. Overall, however, factors that predispose or inhibit individuals' propensities to try alternative forms of illness management appear only to play a modest role. Furthermore, the absence of a relationship with education suggests that we should investigate other factors to explain why some people are trying and adopting alternative therapies.

Examination of a comprehensive set of need factors capturing the illness context, (including the type of chronic illness, co-morbidity, perceived seriousness, duration of the condition, doctor visits and prescription medication use), supports research that concludes that the objective and subjective health status of individuals is a primary factor affecting use (Gray, 1985; Sutherland & Verhoef, 1994). The presentation of certain illnesses appears to also affect the propensity to try various alternative therapies, for example, persons with hypertension are half as likely to try them as those with arthritis or rheumatism. Perhaps this is partly because some individuals do not perceive hypertension as a chronic illness and they have fewer symptoms. Moreover, co-morbidity magnifies the probability of resorting to alternative practices by a factor of 1.23 for each additional illness. Indeed, there appears to be a cumulative impact of illness that fuels

the propensity for older adults to turn to unconventional medicine. Whereas, the length and perceived seriousness of the condition appear to be more important illness attributes for determining patterns of meditation and prayer. This may signify that the mind–body experience of meditation and the spiritual experience of prayer become important coping mechanisms for persons perceiving their chronic condition as life threatening and among those whose illness has continued for a longer period of time.

Although characteristics of the illness are particularly important in our understanding of how and why older people manage their chronic illness through the use of unconventional medicine, use of the formal health system also appears to play a role. It is interesting that individuals who take more prescription medications actually are less likely to use alternative therapies, as well as the converse. Yet, number of doctor visits was not found to be associated with either type of unconventional practices. On the one hand, the inverse association uncovered for prescriptions suggests that older persons with chronic conditions who engage in alternative therapies *substitute* conventional medicine with unconventional medicine to some degree. This lends support to a growing number of studies indicating that alternative therapy use may be a response to unsuccessful allopathic treatments of disease states obtained through the formal system (Moore et al., 1985; Vincent & Furnham, 1996). On the other hand, the absence of a relationship between number of doctor visits and use of alternative therapies suggests that the conventional and unconventional medical systems are not completely opposed to one another. This finding is consistent with several studies showing that persons resorting to alternative therapies do not stop seeing their doctors and, for some individuals, are referred to alternative practitioners through their general practitioner or specialist (see e.g., Marshall et al., 1990; Eisenberg et al., 1993; Northcott & Bachynsky, 1993).

Indeed, the degree of complementarity of the informal and formal health systems remains controversial. Noting the salience of the emerging biopsychosocial paradigm, Longino (1997) calls for an integrated health delivery system capable of synthesizing the public health sphere and curative medicine. However, many other researchers maintain, as does Lewith (1997, p. 48) that, "there are few, if any, formal pathways through which to implement and integrate the relevant aspects of complementary medicine into conventional medicine".

In the Canadian and American health care systems, it would appear that several interrelated issues loom on the horizon. One of these is health insurance coverage of various alternative therapies provided by health professionals (e.g., massage therapy, chiropractic, acupuncture, naturopathic medicine, etc.). Legislation of user fees and limited coverage under provincial insurance programs in Canada may inhibit use of many therapies, for example, access to massage therapy requires a referral and a user fee for a limited number of annual visits under the health plans in several provinces. Thus, insurance programs can influence the development and sustainability of alternative health professions. In this regard, the medical profession has the strongest lobbying power for influencing health legislation and for acceptance of new health professions (Schepers & Hermans, 1999). Wardell (1994) has developed a hierarchical classification system of alternative health practitioners – quasi, marginal, limited and ancillary types – which has been used to document the evolution of specific alternative health professions, typically in relation to the medical profession and the organization of training and licensing standards. As Schepers & Hermans (1999) contend, health care systems may well become more pluralistic, even if medical dominance is preserved.

Furthermore, there is an issue of control over prescribing, developing, and dispensing of herbal remedies, which are fast becoming multi-million dollar industries in most developed countries. For example, the most commonly prescribed medicine in Germany is ginkgo, a herbal remedy to which a variety of healing properties are attributed. Physicians, pharmacists and pharmaceutical companies have entered this new arena along with representatives from alternative medicine (especially naturopathic medicine), and private industry. The integration of the conventional and unconventional systems, therefore, is integrally tied to the economics of health care, in addition to the evolution and acceptance of alternative health professions.

With respect to the findings for the enabling component, we anticipated that the expanded set of facilitators examined in this research would also shape alternative therapy use among older adults managing a chronic illness. Indeed, one of the strongest findings was that reading about one's chronic illness (at the time of diagnosis) *doubles* the likelihood of using alternative therapies to manage that illness. Information about chronic illness has become increasingly available through the various illness societies (e.g., Heart & Stroke Foundation, Arthritis Society, etc.), books, other print media, and via the Internet. Regardless of the source, information about chronic illness typically includes the use of alternative therapies, albeit the degree of acceptance of these practices is highly variable. And while many information sources recommend that individuals consult their doctor, a significant number of persons apparently are inhibited to discuss

alternative therapies with their family physician because they feel that he/she lacks a full understanding of their condition and may not condone unconventional medicine (Murray & Rubel, 1992). Yet, the mere discussion of alternative therapies as a means to manage chronic illness may encourage further investigation by individuals into their efficacy, cost, availability, and access. Interestingly, we also found that alternative therapy use is influenced by the combination of having a high level of illness self-efficacy (perceived confidence that one can control aspects of one's illness) and reading about one's illness. Thus, a greater feeling of confidence to control chronic illness coupled with reading information about one's illness facilitates the use of alternative therapies. This seems to be indicative of persons striving for greater autonomy and personal involvement in their illness management.

Income was also found to influence alternative therapy use. Persons accessing total household incomes in the $20,000–$49,999 and the upper ($100,000+) groups compared to the lowest (under $20,000) income group are less likely to use alternative therapies. This is in contrast to the positive association found in an earlier Canadian study (*CMAJ*, 1997). However, our study focuses only on persons aged 50 and over who have a diagnosed chronic illness, whereas the previous research includes all adults in the population. It would appear, however, that further research is needed on how income affects the process of trying alternative therapies for various groups of healthy and ill groups.

Turning to meditation and prayer, only one enabling relationship was found for engaging in these mind-body techniques to manage chronic illness – the simultaneous effect of moderate levels of mutual aid (regular contact with someone with the same illness) and a higher number of confidants. It appears that social support, combined with having someone with whom to speak who has the same illness, enables mind-body approaches to illness management. While we recognize that meditation and prayer may be two relatively distinct coping behaviours, there appears to be something important about the social milieu that affects how people deal with their chronic illness on a psychosomatic level.

In conclusion, there is no doubt that people adopt a multitude of strategies to manage their chronic illness and that these are continually changing because of the dynamics of the illness or co-morbid conditions as people age. The Andersen–Newman Model remains useful in providing a conceptual frame for positioning major dimensions of health utilization and self–care behaviour. More specifically, we found that the illness

context is critically important in affecting the propensity of individuals to use alternative therapies. So too are certain predisposing factors (particularly age), use of prescription medicines for illness maintenance, and the facilitating forces of health information, income, and key interactions tapping into self–efficacy and reading, as well as those pertaining to mutual aid and social support. These patterns are occurring against the backdrop of social change, including shifts in the normative and preference structures underlying health behaviour; increasing information, including website developments; availability and access of alternative therapies; the evolution of alternative health professions; and reformulation of the health care system.

It is apparent from this study that further research is required to address the gaps in our understanding of how and why people engage in unconventional medicine as part of their illness management system. In particular, it would be useful to gather data that contain further details about the specific type of alternative therapy use, frequency, duration, and perceived impact on different populations of healthy and ill individuals. Furthermore, the complementary and integrative aspects of conventional and unconventional medicine remain an issue of major importance. Indeed, further establishing the efficacy and non-efficacy of various alternative approaches to illness management would probably be the most effective method to erode the barriers to the integration of "complementary" medicine.

Notes

References

Andersen, R. (1995). Revisiting the behavioral model and access to medical care: Does it matter? *Journal of Health and Social Behavior, 36*(March),1–10.

Andersen, R., & Newman, J. (1973). Societal and individual determinants of medical care use in the United States. *Milbank Memorial Fund Quarterly,* 51, 91–124.

Astin, J.A. (1996). Why patients use alternative medicine: Results of a national study. *Journal of the American Medical Association, 279*(19), 1548–1553.

Bandura, A. (1986). *Social foundations of thought and action*. NJ: Prentice Hall.

Boisset, M., & Fitzcharles, M-A. (1994). Alternative medicine use by rheumatology patients in a universal health care setting. *Journal of Rheumatology, 21*, 148–152.

Chappell, N., & Blandford, A. (1987). Health service utilization by elderly persons. *Canadian Journal of Sociology, 12*, 195–215.

Clark, N., Becker, M., Janz, N., Lorig, K., Rakowski, W., & Anderson, L. (1991). Self-management of chronic disease by older adults: A review and questions for research. *Journal of Aging and Health, 3*(1), 3–27.

Clark, N., Janz, N., Dodge, J., Schork, M., Fingerlin, T., Wheeler, J., Liang, J., Keteyian, S., & Santinga, J. (2000). Changes in functional health status of older women with heart disease: Evaluation of a program based on self-regulation. *Journal of Gerontology: Social Sciences, 55B*(2), S117–S126.

CMAJ. (1991). One in five Canadians is using alternative therapies, survey finds. *Canadian Medical Association Journal*, *144*(4), 469.

CMAJ. (1997). Higher earners seek more alternative care. *Canadian Medical Association Journal, 157*(7), 996.

Cohen, S., & Syme, L. (1985). *Social support and health*. New York: Academic Press.

Dean, K., & Kickbusch, I. (1995). Health related behaviour in health promotion: utilizing the concept of self-care. *Health Promotion International*, *10*(1), 35–40.

DeMaris, A. (1995). A tutorial in logistic regression. *Journal of Marriage and the Family, 57*, 956–968.

Eisenberg, D.M., Kessler, R.C., Foster, C., Norlock, F.E., Calkins, D.R., & Delbanco,T.L. (1993). Unconventional medicine in the United States: Prevalence, costs, and patterns of use. *New England Journal of Medicine*, *328*(4), 246–252.

Fisher, P., & Ward, A. (1994). Complementary medicine in Europe. *British Medical Journal, 309*, 107–111.

Fleming, G., Giachello, A., Anderson, A., & Andrade, P. (1984). Substitute, supplement or stimulus for formal medical care services? *Medical Care*, 22, 950–966.

Furnham, A., & Forey, J. (1994). The attitudes, behaviours and beliefs of patients of conventional vs. complementary (alternative) medicine. *Journal of Clinical Psychology, 50*(3), 458–469.

Gray, D. (1985). The treatment strategies of arthritis sufferers. *Social Science and Medicine, 12,* 507-515

Kart, C.S., & Engler, C.A. (1994). Predisposition to self-health care: Who does what for themselves and why? *Journal of Gerontology: Social Sciences, 49*(6), S301–S308.

Kelner & Wellman (1997). Health care and consumer choice: Medical and alternative therapies. *Social Science and Medicine, 45*(2), 201–212.

Kestin, M., Miller, L., Littlejohn, G., & Wahlqvist, M. (1985). *Medical Journal of Australia*, 143, 516–519.

Kronenfeld, J.J., & Wasner, C. (1982). The use of unorthodox therapies and marginal practitioners. *Social Science and Medicine*, *16,* 1119–1125.

Lewith, G. (1997). A measure of success. *British Journal of General Practice*, *47*, 47–49.

Longino (1997). Beyond the body: An emerging medical paradigm. *American Demographics,* Dec., 14–19.

Lorig, K., Brown, B.W., Ung, E., Chastain, R. Shoor, S., & Holman, H.R. (1989). Development and evaluation of a scale to measure the perceived self-efficacy of people with arthritis. *Arthritis and Rheumatism, 32,* 37–44.

Lorig, K., & Holman, H.R. (1989). Long-term outcomes of the Arthritis Self-Management Study: Effects of reinforcement efforts. *Social Science and Medicine, 29,* 221–224.

McDonald-Miszczak., L., Wister, A.V., & Gutman, G.M. (2001). Self-care among older adults: An analysis of the objective and subjective illness context. *Journal of Aging & Health, 13* (1), 120–145.

MacLennan, A.H., Wilson, D.H., & Taylor, A.W. (1996). Prevalence and cost of alternative medicine in Australia. *The Lancet, 347,* 569–573.

Marshall, R., Gee, R., Israel, D., Edwards, F., Dumble, J., Wong, S., Chan, C., Patel, R., Poon, P. & Tam, G. (1990). The use of alternative therapies by Auckland general practitioners. *New Zealand Medical Journal, 103,* 213–215.

Menard, S. (1995). *Applied Logistic Regression Analysis. Quantitative Applications in the Social Sciences*. London: Sage.

Millar, W.J. (1997). Use of alternative health care practitioners by Canadians*. Canadian Journal of Public Health, 88*(3), 154–158.

Moore, J., Phipps, K., & Marcer, D. (1985). Why do people seek treatment by alternative medicine? *British Medical Journal, 290,* 28–29.

Montbriand, M., & Laing, G. (1991). Alternative health care as a control strategy. *Advanced Journal of Nursing, 16,* 325–332.

Morgan, S.P., & Teachman, J.D. (1988). Logistic regression: Description, examples, and comparisons. *Journal of Marriage and the Family, 50*; 929–936.

Murray, J., & Shepherd, S. (1993). Alternative or additional medicine? An exploratory study in general practice. *Social Science and Medicine, 37*(8), 983–988.

Murry, R.H., & Rubel, A.J. (1992). Sounding board: Physicians and healers – unwitting patterns in health care. *The New England Journal of Medicine, 326*(1), 61–64.

Northcott, H.C., & Bachynsky, J. (1993). Research Note: Concurrent utilization of chiropractic, prescription medicines, nonprescription medicines and alternative health care. *Social Science and Medicine*, 37(3), 431–435.

OAM–NIH Classification of Alternative Medicine Practices. (1999). Office of Alternative Medicine. Webpage.

Ory, M., & Defriese, G. (Eds.) (1998). *Self-Care in later life: Research, program & policy Perspectives*. New York: Sage.

Richmond, C. (1991). As their health improves, British broaden quest for alternative health care. *Canadian Medical Association Journal, 144*(7), 912–914.

Romeder, J.M. (1990). *The self-help way: Mutual aid and health*. Ottawa: Canada Council on Social Development.

Schepers, R.M., & Hermans, H.E. (1999). The medical profession and alternative medicine in the Netherlands: Its history and recent developments. *Social Science & Medicine, 48*, 343–351.

Sutherland, L., & Verhoef, M. (1994). Why do patients seek a second opinion or seek alternative medicine? *Journal of Clinical Gastroenterology, 19*(3), 194–197.

Verhoef, M., Sutherland, L., & Brkich, L. (1990). Use of alternative medicine by patients attending a gastroenterol-

ogy clinic. *Canadian Medical Assocaition Journal, 142*(2), 121–125.

Vincent, C., & Furnham, A. (1996). Why do patients turn to complementary medicine? *British Journal of Clinical Psychology, 35,* 37–48.

Wardell, W.I. (1994). Alternative medicine in the United States. *Social Science & Medicine, 38*(8), 1061–1068.

Wister, A.V. (1992). Residential attitudes and knowledge, use, and future use of home support agencies. *Journal of Applied Gerontology, 11(*1), 84–100.

Wister, A.V. (1995) The relationship between self–help group participation and other health behaviours among older adults. *Canadian Journal of Community Mental Health, 14*(2), 23–38.

Wister, A.V., & Dean, K. (1998) A comparative analysis of graphical interaction and logistic regression modelling: Self–care and coping with a chronic illness in later life. Paper presented at the 14th World Congress of Sociology, Montreal, Quebec, July 26–Aug. 1, 1998.

Wolinsky, F.D. (1978). Assessing the effects of predisposing, enabling and illness-morbidity characteristics on health service use. *Journal of Health and Social Behaviour, 19,* 384–396.

Wolinsky, F.D., & Johnson, R.J. (1991). The use of health services by older adults. *Journal of Gerontology: Social Sciences*, *46*(6), S345–S357.

Zimmer, Z., & Chappell, N. (1994). Mobility restriction and the use of devices among seniors. *Journal of Aging and Health*, *6*(2), 185–208.

Appendix

Lorig Arthritis Self–efficacy Scale

I am going to ask you how confident you are about your ability to control different aspects of your condition. On a scale from 1 to 5, where 1 is not at all confident, and 5 is totally confident, how confident are you that you can…

1. Control your fatigue?

2. Regulate your activities so as to be active without aggravating your arthritis?

3. Do something to help yourself feel better if you are feeling blue?

4. Manage arthritis pain during your daily activities (compared to other people with arthritis like yours)?

5. Manage your arthritis symptoms so that you can do the things you enjoy doing?

6. Deal with the frustration of arthritis?

7. Decrease your pain quite a bit?

8. Continue most of your daily activities?

9. Keep arthritis pain from interfering with your sleep?

10. Make a small-to-moderate reduction in your arthritis pain by using methods other than taking extra medication?

11. Make a large reduction in your arthritis pain by using methods other than taking extra medications?