COMPLEMENTARY AND ALTERNATIVE MEDICINE USE AMONG OLDER ADULTS: THE ROLE OF HEALTH BELIEFS.

by

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THESIS SUBMITTED IN PARTIAL FULFILLMENT OF

THE REQUIREMENTS OF THE DEGREE OF

MASTER OF ARTS

in the

Gerontology Program

SIMON FRASER UNIVERSITY

August 2003

APPROVAL

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Degree: MASTER OF ARTS (GERONTOLOGY)

Title of Thesis: Complimentary and Alternative Medicine Use Among Older Adults: The Role of Health Beliefs

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COMPLEMENTARY AND ALTERNATIVE MEDICINE USE AMONG OLDER ADULTS: THE ROLE OF HEALTH BELIEFS.

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Abstract

This thesis used panel data to examine patterns and predictors of complementary and alternative medicine (CAM) use with a focus on the role of health beliefs. Two health beliefs were examined: disenchantment with medicine and an alternative ideology (i.e., personal and spiritual approach to health). It is hypothesized that having either of these two health beliefs increases the likelihood of using more alternative types of CAM, and furthermore, that this effect is magnified for CAMs deemed to be further from mainstream medicine. These health beliefs are interpreted as part of a push/pull model. In addition, the Health Belief Model (HBM) and the Socio-Behaviourial Model (SBM) are employed to frame and organize all of the predictors of CAM use among older adults. The sample used in this research is comprised of a sub-sample of adults aged fifty and older (n=4401) drawn from the 1996/97, 1998/99 and 2000/01 National Population Health Surveys. Measures of health, functional ability, health beliefs and socio-demographics are used to predict chiropractic, massage therapy, and acupuncture/homeopathy/naturopathy use compared to non-use in 1998/99/. The second part of this thesis examined CAM use in 2000/01 based on 1998/99 predictors to determine the strength of these health beliefs in predicting CAM use two years later.

The results suggest that CAM users are not a homogenous group. Generally, CAM users are more likely to be younger rather than older, and more educated with higher incomes. Being female predicted massage therapy use only. Predisposing characteristics contributed the most to the proportion of explained variance for massage therapy (8.4%), whereas need factors explained most of the variation in chiropractic use (3.4%). With respect to health beliefs, weak support was found only for the pull factors of use. As CAM users move further from the medical model, having an alternative ideology increases the odds of chiropractic, acupuncture, homeopathy and naturopathy use but not massage therapy. Disenchantment with medicine did not increase the likelihood of CAM use, as expected. These weak associations remained in the longitudinal analyses. Future research, using pathway studies, should examine the interface between the formal health care system and CAM, particularly how CAM supplements or replaces mainstream medicine.

Acknowledgements

Thank you to the Michael Smith Foundation for Health Research for acknowledging seniors' health care choices as an important research area and for providing the financial support to bring my research interests to fruition. Thanks also to Dr. Andrew Wister for his encouraging words and wise advice in my Masters studies: there is no need to re-invent the wheel, focus on one part of the wheel and know it well. I am also grateful for the keen eyes of Dr. Barb Mitchell who fell into the role of writing coach and for my dear grandmother who began my grammar lessons years ago. And finally, thank you Chris for your faith in me to 'get it out the door' and to Stella for helping me find balance.

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Chapter One: Introduction

1.1 Background

Throughout North America, more and more people are using complementary and alternative medicine to treat back problems, headaches, asthma, depression and arthritis among other chronic ailments (Astin, 1998; Eisenberg, Davis, Ettner, Appel, Wilkey, Van Rompey, & Kessler, 1998). Eisenberg and colleagues (1998) found that the use of alternative medicine for Americans grew from 34% in 1990 to 39% in 1997. In Canada, 4 million Canadians sought CAM in 1996, up 2% from 1994, a small but significant increase (Statistics Canada, 2001). Other population studies confirm these trends (Astin, Pelletire, Marie, & Haskell, 2000; Astin, 1998). This increase in CAM use is reflected in all age groups, including older adults, although CAM use is usually lower for this age group. Current trends indicate that the young old are using CAM at surprising rates, and that this trend is not expected to end before the baby boomers age.

Not only are the absolute rates of CAM use increasing, but also an increase in the types of CAM sought is apparent. The increased use of CAM reported in Canada between 1994 and 1998 reflect an increase in the use of acupuncture, homeopathy and massage therapy, whereas visits to a chiropractor remained stable (Statistics Canada, 2001). Given that chiropractors are considered to be more mainstream, and therefore less alternative, this would indicate that Canadian adults are using more diverse alternative practitioners at greater rates than ever before. Interestingly, it was not long ago that the elderly were considered a homogenous group and that all people over the age of sixty-five exhibited similar behaviour and traits. This same misrepresentation is what challenges CAM research today. Research typically overlooks the differences among

CAM users and considers all aspects of health seeking behaviour to be similar among CAM users.

Health beliefs play an important role in health-seeking behaviour. Health beliefs, like medical skepticism and disenchantment with conventional medicine tend to contribute to a decreased level of trust and confidence in the conventional medical model (Furnham & Smith, 1988). In Canada, there has been a small but consistent increase in the number of people who report unmet health care needs; either due to a dislike of doctors, a feeling that this type of care is unnecessary, or it was too costly (Statistics Canada, 2001). For example, in 1994, 4% of Canadian males (aged 12 and over) and 5% of Canadian females (aged 12 and over) reported unmet health care needs. This figure increased to 6% for females in 1996, and remained stable for males (Statistics Canada, 2001). Self-perceived unmet health care needs have shown positive growth over the last six years, while a parallel growth in CAM use can also be seen for the last decade. Thus, a growing dissatisfaction with conventional medical care could *push* people to use CAM if experience with the conventional medicine has not provided satisfactory care (Astin, 2000; Pawluch, Cain, & Gillet, 1994; Taylor, 1984).

Other health beliefs besides medical skepticism or disenchantment have been shown to influence CAM use. People are taking more responsibility for health, participating more in health-care decisions and choosing health care models which are more in line with spiritual and philosophical beliefs (Astin, 1998; Astin et al., 2000; Goldstein, 2000). For instance, people who report that spirituality plays an important role in life were more likely to use CAM than those who did not (Astin, 1998). Furthermore, CAM users are typically more likely to feel that they themselves, not medical doctors, are

responsible for health and health care decisions (Kelner, 2000). Pawluch and colleagues (1994) describe this as an "alternative ideology", or philosophical compatibility with CAM that *pulls* people to use CAM. Others argue indirectly that it is not *push* or *pull* factors working in isolation that drive CAM use, but rather a combination of both (Astin, 1998; Kelner & Wellman, 1997).

Over the last decade, considerable research has shown that CAM users differ from people who do not use CAM in terms of health status, socio-demographic factors and belief systems; yet there are still substantial areas of CAM research yet to be explored. For instance, there are few Canadian studies that look at the predictors and patterns of CAM use at the population level (Boisset & Fitzcharles, 1994) rather than only sub-groups of CAM users such as HIV or cancer patients. There are even fewer studies that observe how specific age groups, such as older adults, use CAM (Astin et al., 2000). Another underdeveloped area of CAM research is the analysis of longitudinal data. This type of data enables insight into how health beliefs and health seeking behaviour change, or remain the same, for those who use CAM compared to those who do not.

It is for these reasons that an investigation into the relationship between push and pull factors of CAM use and older adults is warranted. In order to explore this fast growing sector of health care, it is necessary to examine many aspects of health beliefs while controlling for the need, or chronic illness context, that has repeatedly been shown to increase the likelihood of CAM use. Panel data from the National Population on Health Survey, a longitudinal study of Canadians, will be used to examine the predictors and patterns of CAM use for older adults between 1998/99 and 2000/01. Results from this paper will contribute to the pressing demand for knowledge on why people are

choosing alternative health care practitioners. Moving this knowledge forward, and looking beyond the generic label of 'CAM user' is an important step in preparation for the greatest change in health care utilization Canada can expect: the aging of the baby boomers (born 1946-1964).

Chapter Two: Review of the Literature

This chapter describes Complementary and Alternative Medicine within the Canadian context. A brief description of specific types of Complementary and Alternative Medicine (CAM), such as chiropractic, massage therapy, acupuncture, homeopathy and naturopathy will begin, followed by a basic review of terminology for CAM therapies. Attention will then turn to the theoretical aspects of CAM use and how health beliefs differ between CAM users and non-users. A description of the blended theoretical model used for this research will follow. This chapter will conclude with a review of the literature using a blended theoretical model to frame and organize the many predictors of CAM use for older adults.

2.1 The History of Complementary and Alternative Medicine

There is no single definition of CAM that is used by everyone. In fact, the inability to clearly define CAM and come to an agreeable definition across all parties and systems is very difficult. In most cases, the definition of CAM is arbitrary and is usually based on the perspective of the person doing the defining (Kelner & Wellman, 2000). In 1995, the Office of Alternative Medicine defined CAM as:

> Complementary and alternative medicine (CAM) is a broad domain of healing resources that encompasses all healthy systems, modalities, and practices and their accompanying theories and beliefs, other than those intrinsic to the politically dominant health system of a particular society or culture in a given historical period. CAM includes all such practices and ideas self-defined by their users as preventing or treating illness or promoting well-being. Boundaries within CAM and between the CAM domain and the domain of the dominant system are not always sharp or fixed (1997, p.50).

Common ways to describe CAM are 'unproven', 'unorthodox', 'fringe', 'holistic', 'unconventional' and 'alternative' therapies (Dossey, 1997; Lorenzi, 1999). Basically, any therapy not taught at accredited medical schools is considered outside of mainstream medicine and therefore 'marginal'. More recently, the term "complementary and alternative medicine" (CAM) is being used to describe health practices outside of mainstream medicine and this term appears to be accepted by researchers and practitioners (Kelner & Wellman, 2000). Some consider "complementary" to refer to use alongside conventional medicine use, whereas "alternative" describes exclusive use of therapies in place of conventional medicine (Lorenzi, 1999). This research does not endorse this definition completely. Instead, for this research, CAM is considered to be an umbrella term that includes chiropractors, acupuncturists, massage therapists, homeopaths, and naturopaths.

There are many other types of CAM to consider other than the five types just mentioned. Examples of other types of CAM include reflexology, Alexander technique, Reiki, herbology and spiritual healers, to name only a few. Informal practices such as home-remedies (i.e., megavitamins, special diets, herbal supplements), folk medicine and meditation will not be analyzed for this research. The present research is an examination of formal types of CAM in relation to allopathic medicine, therefore lay and informal practices will not be examined. Looking at both informal and informal types of CAM is beyond the scope of this research. This decision is made even though both formal and informal CAM are used by older adults and are considered to be important elements of health care and self-care by some. Furthermore, the exclusion of lesser-used CAM

therapies and informal practices such as meditation from the National Population Health Survey also contributes to the emphasis on formal CAM in this research.

Wide attention turned to CAM use over a decade ago when Eisenberg, M.D. and colleagues, Kessler, Foster, Norloc, Calkins, and Delbanco (1993) reported on the increased use of CAM in the United States (p. 246). This article, published in the New England Journal of Medicine, alerted the medical community to the fact that consumers were using CAM in large numbers and paying out of pocket to do so. Consequently, this article established that contrary to popular belief, CAM users are well-educated, middle aged adults, not the hippies and young philistines previously thought to use CAM. Attention from the public and media in the 1990s, along with stricter regulation and licensure practices paved the way for greater acceptance of CAM therapies by medical doctors, consumers and society (Goldstein, 2000).

Tougher regulation laws and the increase in the number of regulated CAM professions has also helped clarify certified health practices from "scam" or "bogus" therapies (Smith, 1997). In 1998, the National Center for and Alternative Medicine was created in the United States to assist with regulation. The National Center for and Alternative Medicine (NCCAM) is one of 28 agencies under the onus of the National Institute of Health. Initially developed to scientifically assess complementary and alternative medicine, the NCCAM has evolved to include information dissemination and integration of CAM modalities into conventional medical models. In Canada, there are two divisions that regulate CAM modalities: the Office of Natural Health Products (ONHP), established in 1999, which overlooks the natural food and herbal industry and

the Therapeutic Products Program. Both are funded by the federal government of Canada to ensure quality and safety for public use of most CAM modalities.

Within the last decade, the regulation and licensure practices of CAM therapies and an increased demand for the integration of CAM therapies into medical school curriculum have contributed to society's acceptance of CAM (Goldstein, 2000). Consequently, CAM appears to have a stronghold in the once medically dominated health care system. This stronghold can be measured by the increased rate of CAM use evident in North America today, and over the last decade. Other examples of CAM's acceptance into the mainstream include an increase in the number of private insurance plans covering the cost of CAM therapies, and a growing number of integrated therapy centers. These centers usually include a medical doctor, and an alternative practitioner(s). It is not surprising that how CAM is viewed within the context of an allopathic society (mainstream) likely influences a person's health beliefs and, in turn, influences health behaviour (Valente, 2000).

Chiropractic

Modern Chiropractic is the mostly common known and utilized complementary therapy. Chiropractic originates from over one thousand years ago when Hippocrates recorded manipulative techniques (Leach, 1994). Modern chiropractic, however, was officially established over one hundred years ago where a Dr. Palmer found that manipulation of the spine corrected many patient complaints. The broad scope of practice once associated with chiropractic care has been downplayed over the last several decades as chiropractic care more closely models a primary health care delivery rather than the naturopathic roots of its past (Coburn, 1993). This alignment with diagnostic

and other basic sciences of the medical community has contributed to the regulation and acceptance of chiropractic in North America. Due to the "general-diagnosis" training that chiropractors receive (similar in scope to medical doctors), they are one of five health care professions in Canada authorized to diagnosis (Shah, 1998). As such, there is no need to have a referral to see a chiropractor in Canada. Each province in Canada has a regulatory board that governs chiropractors (for example, chiropractors in British Columbia are governed under the B.C. Chiropractic Association). The Canadian Chiropractic Association oversees the provincial regulatory boards.

Due to a long-standing divide between the chiropractic and medical associations, it is not clear where chiropractic stands in the health care field. By definition, chiropractic care is considered to be one of the allied health professions, along with dentistry and nursing (Shah, 1998). Usually though, chiropractic is considered to be a modality and not considered an alternative or marginal therapy. Thus the following research will isolate chiropractic use from the general category of CAM and consider chiropractic to be a form of CAM mostly aligned with conventional health care. In other words, of the CAMs examined in this research chiropractic would be the most similar to mainstream medicine.

Massage Therapy

Massage therapy is a profession in which the practitioner applies manual techniques involving soft-tissue manipulation or applying pressure to the body. Within this profession, there are many types of massage techniques. Some examples are neuromuscular therapy, reflexology, myofascial release, cranio-sacral and effleurage (American Massage Therapy Association, 2002). Proponents of massage therapy claim

that massage promotes healing at the physical, emotional and mental levels. Currently there is no regulatory body that governs massage therapists, although this is changing. In 1995, the provincial government of British Columbia established the Massage Therapists Regulation (Government of British Columbia, Health Professions Act, 2003). This legislation governs massage therapists in BC, in addition to other health care professionals. Recently, changes to the Health Professions Act in 2003 called for greater regulation of massage therapists in BC, as well as other CAM practitioners. A general rule of thumb for regulation in Canada, however, is that a massage therapist must have a minimum 2200 hours of training before charging for massage services (Canadian Massage Therapy Alliance, 2002). A person does not need a referral from a medical doctor to see a massage therapist in Canada. Thus, access to massage therapy, like chiropractic and other CAM, is a function of a many factors including a person's knowledge of the CAM, their ability to pay for the services and other predisposing characteristics.

Acupuncture, Homeopathy and Naturopathy

Acupuncture is an ancient Chinese practice involving the use of needles to puncture the skin in one of 200 acupressure points on the human body. These points are believed to be pathways, or meridians for Qi (universal energy). If a person has illness or pain, acupuncturists believe that activating pressure points releases the blocked Qi along the meridians of the body. Releasing blocked Qi allows the body to heal by returning balance to the body and relieving pain.

The practice of acupuncture is not as well established as chiropractic in the health care field. Perhaps the lack of establishment is due to two opposing schools of thought

within acupuncture. The Traditional Chinese Medicine (TCM) acupuncturists follow different philosophies than other acupuncturists. The lack of solidarity within the acupuncture field has contributed to the lack of federal and provincial regulation for this type of CAM (Welsh, Wellman & Kelner, 2002). As such, acupuncture is often considered to be more alternative when compared with chiropractic and massage therapy. Similar to chiropractic and massage therapy, acupuncture users do not need a referral from a medical doctor. However, acupuncturists do not have the same training and education as chiropractors therefore they are limited in diagnostic and treatment scope. It is for these reasons that acupuncture is considered to be more alternative to mainstream medicine than its complementary counterparts, chiropractic and massage therapy.

The final two CAM therapies analyzed in this research are homeopathy and naturopathy. Although considered to be separate professions, they are grouped together in the National Population Health Survey (i.e., *In the last twelve months have you visited a homeopathic/naturopathic doctor*?). This grouping is retained in this anlysis. In reality, however, there are differences between the two CAM professions. Naturopathic practitioners consider themselves to be primary health care practitioners. Lifestyle counseling, nutrition, manipulation techniques, hydrotherapy, and botanical medicines (herbals) are a few examples of the range of care offered by naturopaths. Naturopathy also includes homeopathic remedies, but not to the extent that homeopathic practitioners offer. The underlying principle for homeopathic medicine is 'like cures like'. If a substance can cause illness in a person then a diluted version of the same substance can cure. Both homeopaths and naturopaths can prescribe herbal and naturopathic remedies based upon the diagnosis they administer and one does not need a referral from a medical

doctor to see a homeopathic or naturopathic practitioner. Another difference between homeopathy and naturopathy is that, in Canada, homeopathy is not under federal regulation, whereas naturopathy is.

Allopathic Medicine versus Complementary and Alternative Medicine

Just as there are many ways to define CAM, there are also many ways to define allopathic, or formal medicine. A fundamental difference between allopathic medicine and complementary medicine rests on the different approaches to health (Kelner & Wellman, 2000). Allopathic medicine is based on the biomedical approach to health. This approach considers the body to be analogous to a machine that can be repaired and fixed. Allopathic care is mainstream medicine involving the use of medications, chemicals, surgery, etc. to address health issues. In contrast, complementary medicine considers health to be a function of the mind, body and spirit. In the present study, several terms will be used interchangeably when referring to allopathic medicine: conventional medicine, formal medicine and mainstream medicine. These terms are considered legitimate descriptors of allopathic medicine (Kelner & Wellman, 2000).

Despite the differences between the five CAM therapies discussed (e.g., modalities used, scope of practice) there are some similarities. Most of these therapies believe in the inherent nature of the body to heal. This differs from mainstream medicine where, in most cases, healing is believed to result from intervention, usually pharmaceuticals and surgical procedures. The way each CAM approaches healing is different. For example, chiropractic uses manual manipulation to release subluxations, or fixations in the spine, while acupuncture uses needles to release blockages and promote

healing. Most CAM therapies do not emphasize surgery or pharmaceuticals in their practices; rather they stress natural remedies and lifestyle.

The inherent healing principle is a common theme of CAM, but fundamentally each CAM is different. The most obvious difference between the CAM types is their relationship, or proximity, to mainstream medicine. It is difficult to measure the relationship between CAM and mainstream medicine because there is no scale or measurable trait that is associated with each. In fact, there is a paucity of research that examines how CAM differs from conventional medicine and virtually no way to measure it. This research takes a conceptual approach to the difference between CAM and mainstream medicine by looking at the professional differences between them based on the diagnostic and education practices associated with each and the licensing and regulation practices outlined by each profession. As outlined by Kelner and Wellman (2000), this approach considers CAM and its relationship to allopathic medicine to be based on the context in which CAM is delivered.

Of the five CAM types analyzed in this thesis, chiropractic is believed to be the most similar, or closest to mainstream medicine based on these similarities: (a) education curriculum; (b) federal and provincial regulation and licensing practices; and (c) the ability to offer diagnostic services. Of course, as discussed earlier, there are fundamental differences that separate chiropractic and allopathic medicine such as scope of practice (e.g., manipulation techniques). Hypothetically speaking, however, on a continuum that represents CAM and its relationship with conventional medicine, chiropractic would be on one end of this continuum closest to mainstream medicine (see Figure One). Massage therapy, a manual technique like chiropractic, is situated in the middle of a continuum of

CAM because it has less regulation, fewer licensing practices and different education requirements than chiropractic or allopathic medicine.

At the other end of the continuum are homeopathy, naturopathy and acupuncture. These therapies involve more alternative techniques than those offered by the conventional medical model (i.e., the use of needles on acupressure points and the prescribing of homeopathic remedies and herbals). Furthermore, the amount of regulation that these three professions face is not as well established as medical and chiropractic professions. Thus, these three CAM practices are less likely, on average, to receive referrals from the medical community because of un-regulation and a lack of professional cohesion within these professions. Consequently, acupuncture, homeopathy and naturopathy are more likely to be considered alternative to mainstream medicine when compared to chiropractic and massage therapy. As such, they represent the opposite end of the continuum, the furthest from mainstream medicine. Even though a fundamental aspect of this research is an examination of health beliefs based on the relationship between these five types of CAM to the allopathic model, this research is not implying that either model is better than the other. In fact, the efficacy of the CAM and the allopathic are not at issue in this research even though it is recognized that the efficacy of CAM and allopathic can influence a person's health beliefs (Kelner & Wellman, 2000).

The difference between allopathic and CAM is not black and white. When looking at frequency of use, there is overlap between the two systems. As Wellman (2000) summarizes there is sequential use of allopathic medicine and CAM, as well, the likelihood that people will use more than one alternative practitioner for the same illness

is also quite high. Based on this dual use, as well as the fact that CAM use in general is not easily dichotomized into yes or no categories, the present research recognizes that CAM use is not an isolated event and places the three groups of CAM on a continuum relative to allopathic medicine. Using a continuum to conceptualize CAM acknowledges an overlap between each CAM type and formal medicine, yet at the same time permits a comparison of each CAM relative to formal medicine based on health beliefs. It is necessary to make assumptions about the relationship between CAM and allopathic medicine in order to move CAM research forward and examine why older adults use CAM.

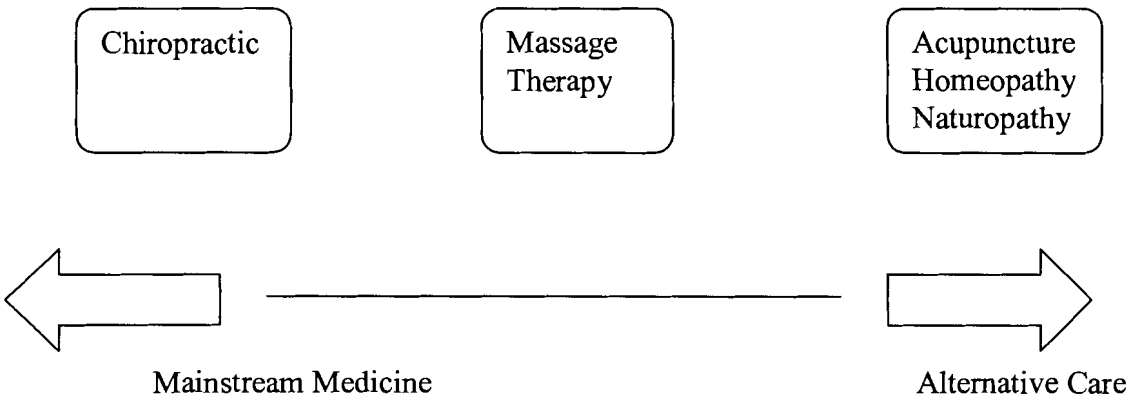

Figure 1. A Continuum of CAM Therapies. A conceptual approach to understanding the relationship between mainstream medicine and different types of CAM based on professional differences between CAM relative to mainstream medicine's scope of education and diagnosis, licensure and regulation.

2.2 Theoretical Literature

The Socio-Behaviourial Model

Traditionally, the Socio-Behaviourial Model (Anderson & Aday, 1978; Anderson, 1995) has been used to study access to and predictors of health care use. Basically, this model proposes that the use of health services is a function of three factors: predisposing characteristics, enabling resources and need factors. An individual is *predisposed* to use health services depending upon demographics (age & gender), social structure (education, occupation and ethnicity), and health belief characteristics (attitudes, values and health knowledge). *Enabling resources* either impede or promote health service use. Family and community resources like income, transportation, health insurance, a regular source of care, and waiting times are examples of enabling resources (Anderson, 1995). Finally, this model assumes that a person's *need* for health services is usually a function of how they view their health and ability to function. Overall, this model contends that access to health services results from a combination of enabling, predisposing and need factors.

Typically only conventional health services, such as physician, hospital and ambulatory services, have been studied using the Socio-Behaviourial Model (SBM). Some researchers have used this model to look at auxiliary services such as adult day care (Chappell & Blandford, 1987). Rarely is CAM use studied using the SBM, although some notable exceptions exist (Kelner & Wellman, 1997; Wister, Chittendon, McCoy, Wilson, Allen & Wong, 2002). A study of self-care practices of Vancouver seniors using the SBM found that those seniors who used complementary and alternative methods (such as chiropractic, massage, acupuncture) mostly did so out of need (Wister et al.,

2002). The type of chronic illness (namely arthritis) and the perceived seriousness of the illness were elements of a person's need for care. Predisposing factors, primarily age, and enabling resources, such as income, had only a modest effect on alternative therapy use in this study.

The second example of research using the SBM to study CAM use was also conducted in Canada. Kelner and Wellman (1997) used the SBM to explore CAM use among 300 Toronto patients, sixty each from five groups of practitioners (family physicians, chiropractors, acupuncturists, naturopaths and Reiki). They found that predisposing, enabling and need factors all contributed to CAM use. For instance, they found that there were marked differences in the education levels and gender (predisposing factors) of CAM users compared to non-users and that those who used CAM reported greater levels of spirituality (enabling factors) than those who did not use CAM (Kelner & Wellman, 1997). Overall, Kelner & Wellman (1997) were able to conclude that the SBM can be "fruitfully applied to the use of alternative, as well as conventional medical services" (p. 211).

Despite the contribution of these two studies (Wister et al., 2002; Kelner & Wellman, 1997) to knowledge pertaining to who uses CAM and why, there are some unanswered questions. Only baseline data from a longitudinal study was used in the Wister et al., (2002) study. Even though the sample size was large enough to have strong statistical power (n=900), these baseline data cannot assess changes over time. Furthermore, only a broad measure of CAM was used, and this cannot distinguish between CAM users because it overlooks the differences among CAM users.

In Kelner and Wellman's (1997) study, the primary interest was 'access' to CAM as seen by the emphasis on the location of the CAM practitioners. Access to CAM, however, is not just a function of enabling resources, such as location. Access is considered in the present thesis to be primarily due to health beliefs. Relying solely on the SBM as a framework, therefore, overlooks the importance of health beliefs in choosing CAM. Another limitation to the Kelner and Wellman (1997) study is that a small non-random sample was used (n=300) which poses serious limitations to the results. Furthermore, the analyses were primarily descriptive which do not allow for casual inference and hypothesis testing. This thesis will address this limitation by using multivariate analyses to determine the influence of need, enabling and predisposing factors, and more importantly the role of health beliefs; the focus of this study. To do this, a combination of the SBM with the Health Belief Model will be used to frame the role of health beliefs in CAM use while controlling for the many predictors of CAM. The intent of this paper is not to test the utility of the SBM directly, but to use the model as a foundation for understanding why older adults use CAM.

Despite the documented benefits of using the SBM, such as good reliability, validity and predictive value (Weiss & Lonnquist, 1996), the model is not without its limitations. The model has been criticized for not detecting the complexities of complementary and alternative medicine use (Pescosolido, 2000; 1991); for not correctly operationalizing health beliefs (Strain, 1990; 1991) and for not being a relevant model to use when analyzing health service patterns by older adults (Houle, Salmoni, Pong, Laflamme & Viverais-Dresler, 2001). Because these limitations are the central considerations of the following research, elements of the Health Belief Model will be

combined with the SBM in order to address these limitations. CAM research is still in its infancy, thus it is feasible to combine health care utilization models in order to find the model that best explains CAM use (Pescosolido, 2000). Furthermore, Salazar (1991) notes that there is no "perfect" theory and combining elements of theoretical models is acceptable (p.134).

The Health Belief Model

The Health Belief Model (HBM) lends itself quite well to research on CAM use. The HBM (Rosenstock, 1974) proposes that health beliefs influence perception, which in turn motivates a person to take, or not take, action in health seeking behaviour. Originally designed to analyze what motivates preventive health behaviours, the HBM has been expanded to include motivation for sick-role and illness behaviour (Shah, 1998). Two key components of the HBM are *perceived seriousness* of the illness/disease and *perceived susceptibility* to illness or disease. Both these components interact to influence whether or not the individual's *perceived benefits of taking action*, overcome the *barriers or cues to action*. In this literature search, no research was found that uses the HBM to explain CAM use. However, the HBM along with the SBM, a model that has proven useful in predicting CAM use, should be effective in analyzing health beliefs as a main predictor of CAM use.

The HBM and the SBM are similar in scope so they complement each other theoretically. Both theories are social psychological approaches to understanding health behaviour and service use (Salazar, 1991). A basic assumption of both theories is that people are rational and that decision-making is a staged process influenced by many factors (Mechanic, 1979; Salazar, 1991). How these theories differ is the reason why this

research is combining the two models to examine CAM use. The SBM looks at broad objective measures, such as access and society, whereas the HBM tends to focus on the subjective aspects of decision-making and the individual (Salazar, 1991). The SBM defines need as either perceived (i.e., personally defined) or evaluated (i.e., symptom assessed by physicians), and in doing so overlooks the dynamic process of defining illness (Mechanic, 1979). The HBM, on the other hand, sees health care utilization as a process made up of situations, cues and values that form one's perception of the need for care. Essentially, the HBM will frame the push and pull predictors of CAM use by attributing the need for care to be more than just personally defined, but also a function of societal values and attitudes.

The next section provides a review of the literature on CAM, the HBM and the SBM. A review of health beliefs and CAM use with the HBM as a framework to organize the push and pull predictors will come first. Next, a general overview of the predictors of CAM use will follow. These predictors will be structured according to the predisposing factors, enabling resources and need of CAM users as outlined in the SBM. This chapter will close with a review of the literature on CAM use over time.

2.3 Reasons for CAM Use & The Health Belief Model

In spite of the mounting evidence about the *who* and *what* of CAM use, very few studies have gone beyond descriptive research and explored the reasons *why* CAM is used. Consequently, the conceptual aspect of CAM research is lacking. Of the few models put forth to describe CAM use is the notion of push versus pull factors. Lynse (1989) initially applied "push and pull factors" to predictors of CAM use. Lynse felt people were *pushed* to alternative medicine because of disappointment with current

medical practices or *pulled* by curiosity. Lynse (1989) did not test these factors directly. Instead, historical examples were used to show that the theoretical and professional differences between alternative and mainstream medicine create an environment where curious or disappointed people have a need to seek alternative therapy.

Pawluch and colleagues (1994) later elaborated on the push/pull hypothesis. They describe a *push* towards alternative medicine resulting from dissatisfaction with or skepticism of mainstream medicine. Disenchantment, or skepticism of conventional medicine results when a person has a negative experience with one or more doctors, or feels that conventional treatments are invasive, unnecessary, cause side effects and treat only the symptoms, not the cure (Astin, 1998; Astin, 2000; Furnham & Bhagrath, 1993; Furnham & Forey, 1994; Lazar & O'Conner, 1997). An "alternative ideology", on the other hand, is the *pull* factor of CAM use (Pawluch et al, 1994). The foundation of this type of ideology is that in order for health to be achieved, there must be a connection between the physical, mental and spiritual. Thus, a person with an alternative ideology is motivated, or pulled toward use of CAM because it is more in line with their holistic philosophy and feelings of responsibility towards health and health-care decisions. The next section will describe the push and pull factors (i.e., health beliefs) of CAM use in more detail.

The PUSH Factor: Medical Disenchantment and Skepticism

Individual thoughts, attitudes and experiences make up health beliefs, which in turn guide decisions and attitudes about health (Anderson, 1995; Salazar, 1991). There are many ways to measure health beliefs. The most common measures include: internal/external locus of control; degree of skepticism; personal health beliefs (i.e.,

susceptibility to illness and perceived efficacy of treatment); desire for control; and philosophical and value constructs (i.e., spirituality and religious beliefs). Some research considers disenchantment and skepticism to represent two different health beliefs (Astin, 2000), but this research will not. Skepticism and disenchantment are very complex concepts, yet the basis of both beliefs is similar: a negative or disappointing experience(s) with mainstream medicine. Therefore it is justifiable to combine both health beliefs.

Health beliefs can predispose people to use health care services differently. Strain (1991) used a random sample of 743 adults, aged sixty and older, living in Winnipeg, Canada to analyze the influence of health beliefs on three types of health services: physician visits, hospitalization and overall service use. Health beliefs were measured by four constructs, three of which were drawn from a factor analysis of 22 items: (a) health internal locus of control, (b) health external locus of control and (c) degree of medical skepticism. The fourth construct, the importance of health maintenance behaviour was a scale measure of intended health behaviours (e.g., exercise, diet, prayer and faith). Of the four health beliefs measured, medical skepticism was statistically significant for all three types of health services. Highly skeptical older adults who strongly agreed with the question "Doctors often tell you there is nothing wrong with you when you know there is" were less likely to use health services. This relationship remained after controlling for need, enabling and other predisposing characteristics of health service use. It is important to note that in Strain's study, health beliefs contributed very little to the overall variance (less than 1% of explained variance) and the relationship was weak. Despite this, and the fact that Strain (1991) did not examine CAM use, her research is important

in identifying that health beliefs influence the type and frequency of health services used by older adults.

Early research by Furnham and Smith (1988) addressed health beliefs and CAM use and they also found that skepticism is a strong predictor of health service use. In Furnham and Smith's (1988) study, they compared 44 homeopathic users and 43 general practitioner (GP) users, both with similar socio-demographic traits. The results demonstrate that homeopathic users were more likely to report that previous visits to GPs resulted in greater levels of dissatisfaction with conventional medicine than GP users (Furnham & Smith, 1988). Homeopathic users, in this study, were less likely to have "blind faith" in mainstream medicine than GP users (p. 688). Thus, medical skepticism is a health belief that is associated with the use of CAM.

Other studies that examine health beliefs find that CAM users, in general, tend to be more skeptical of the medical profession than non-users (Astin et al., 2000; Furnham & Bhagrath, 1993; Furnham & Forey, 1994; Sharma, 1992). Not only are differences in health beliefs found between CAM users and non-users, but different health beliefs among CAM users are also found. Medical patients have been found to be less skeptical of mainstream medicine, when compared to chiropractic patients (more skeptical) and Alexander[1] patients (most skeptical) (Wellman, 1995). Most research indicates that people who use CAM are motivated, or pushed to use it because the formal health care system is not meeting their health care needs. The push factor of CAM use is found not only between users and non-users, but also occurs in varying degrees among CAM users.

[1] Alexander technique is considered a form of alternative therapy. This therapy is based upon movement and re-teaching the mind on appropriate balance and energy exertions (http://www.alexandertechnique.com/at.htm)

The PULL Factor: An Alternative Ideology

Consensus about how to define an alternative ideology is not easily reached. In most cases, the researcher arbitrarily defines what is meant by an alternative ideology. For example, Goldner (2000) describes an alternative ideology as "the belief that individuals must take responsibility for their health" (pg. 215). Kelner and Wellman (1997) propose an alternative ideology to include: (a) having a chronic illness; (b) engaging in preventive health care; (c) having a holistic philosophy of health that is more than the absence of disease; (d) an openness to diverse range of therapies; and (e) an emphasis on personal decision making in health care. Kelner & Wellman (1997) include having a chronic illness as part of an alternative ideology, this research will not. Although it is recognized that chronic illness has a role in shaping health beliefs, this research contends that chronic illness is a more appropriate measure of the physiological need for care, rather than a part of a belief system. This research will define an alternative ideology as: (a) believing that spirituality is important in life; and (b) preferring self-care to medical guided decisions about care. An explanation of how this research came to define an alternative ideology in this way will follow shortly.

Not all research has found disenchantment or skepticism of medicine to be a correlate of CAM use. Astin (1998) found that dissatisfaction with medicine did not predict alternative medicine use in his study of randomly sampled adults (n=1035). Instead, CAM use was predicted by ideological beliefs and spirituality. In Astin's (1998) study, 46% of adults with a holistic philosophy (including spirituality) used CAM, compared with 33% of those with the same belief but did not use CAM. Astin (1998) attributes this finding to a philosophical shift that recognizes the importance of

spirituality and health in choosing health care. In a descriptive analysis of CAM and general practitioner patients, spirituality was also identified as a predictor of CAM (Kelner & Wellman, 1997). Research that has examined spirituality and CAM use has consistently shown that CAM users report greater levels of spirituality than non-users.

Interestingly, when comparing different types of CAM users with users and non-users, Reiki patients reported higher levels of spirituality when compared with naturopath and family physician patients (Kelner & Wellman, 1997). No differences were found between chiropractors and acupuncturist patients in the area of spirituality. This finding supports the view held by this thesis that users of more alternative types of CAM, like Reiki and naturopathy, are more likely to identify with an alternative ideology. Research that has examined spirituality and CAM use has consistently shown that CAM users report greater levels of spirituality than non-users, and spirituality can also be a function of CAM type. Although it is difficult to define and measure spirituality due to the subjective aspects of it, this thesis will consider spirituality and faith to be measured on a scale of how important it is to an older adult. This definition is limited by what the NPHS offers as a measure of spirituality.

An alternative ideology also includes a personal responsibility for health. In addition to self-care, such as exercise, diet, vitamin and mineral supplements, an alternative ideology stresses individual responsibility for health care decisions (Pawluch et al., 1994; Segall & Goldstein, 1988). An important element of an alternative ideology is a personal preference for guiding health care decisions, rather than relying on medical doctors to decide certain aspects of health (McGuire, 1988). In contrast, people who use only mainstream medicine are more likely to believe that physicians are the ones who can

help them most and know the most about illness. Almost 70% of family physician patients (n=60) in Toronto, Canada felt that it is the physician who can help them most with illness, whereas only 20% of alternative patients (n=240) agreed with this statement (Kelner & Wellman, 1997). In essence, self-care and an alternative ideology both stress self-control in decisions regarding health behaviour.

2.4 A General Overview of the Predictors of CAM Use and The SBM

This section will provide a general overview of the literature on CAM use. The SBM will be used to organize the predisposing characteristics, enabling resources and need factors that make up the predictors of CAM use (see Figure 2). Predisposing characteristics, such as age, sex and education will be presented first, followed by income as an enabling resource. Finally, a discussion of the need factors, such as health status, comorbidity and function will end this section.

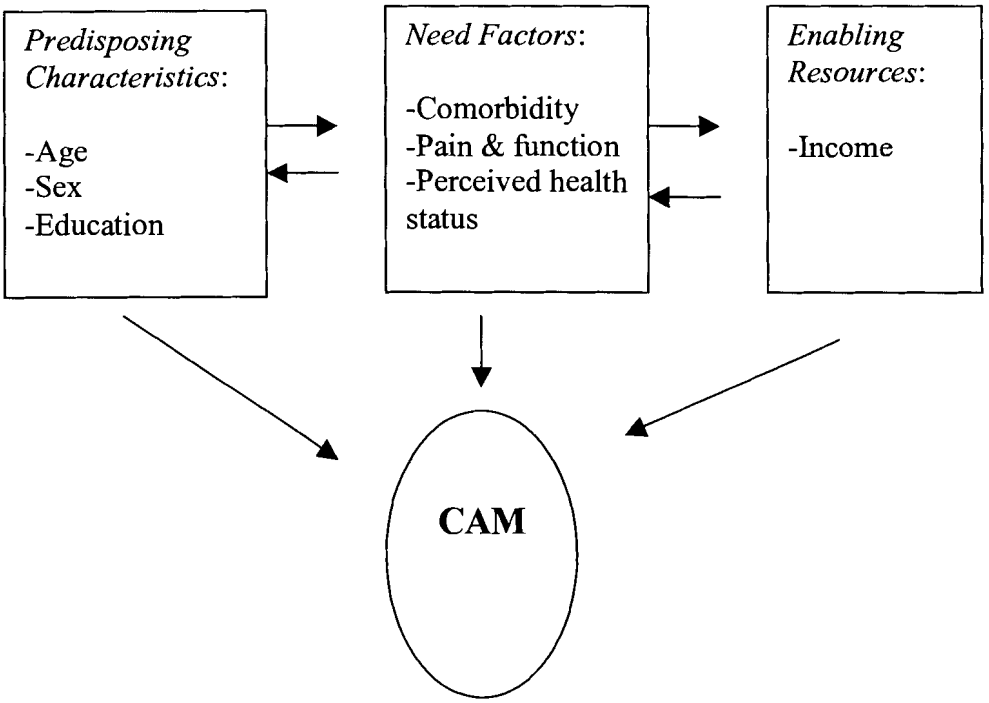

Figure 2. The General Predictors of CAM use and the Socio-Behaviourial Model. The influence of predisposing characteristics, enabling resources, and need factors on the use of CAM.

Predisposing Characteristics & CAM Use

The majority of CAM research studies show that there are socio-demographic differences between CAM users and non-users. CAM users are predominately female, more educated, and younger, rather than older (Astin et al., 2000; Astin, 1998; Eisenberg et al., 1993; Furnham & Vincent, 2000; Kelner & Wellman, 1997; McClennon-Leong & Ross-Kerr, 1999). Age is a strong predictor of CAM use. CAM users typically fall in the young to middle age groups (Astin et al., 2000; Furnham & Vincent, 2000; McClennon-Leong, 1999). In Canada, 20% of CAM users were between the ages of 25-44 and 45-64, compared to 10% of those aged 12-24 and 65 or older (Statistics Canada,

2000). For those aged 65 and older, CAM use is the lowest among the age groups. In one study, 30% of seniors aged 65 and over used CAM compared to 46% of those younger than 65 (Foster et al., 2000). Astin and colleagues (2000) also found that adults aged 65-69 (46%) used more CAM services than those aged 80-84 (31%). Most CAM research contends that CAM users are typically young to middle age, however seniors do use CAM, albeit at a lesser rate than younger ages.

It is not unexpected that females have been found to use CAM at greater rates than males. Gender differences have been found in many health care utilization studies. Women tend to be more introspective and concerned about health issues, with greater body awareness than their male counterparts, particularly as they age (Mechanic, 1992, Strain, 1991). In most cases, these characteristics translate into higher health service use and CAM use (Kelner & Wellman, 1997). In fact, some would also argue that women seek out CAM due to philosophical beliefs. The holistic philosophy of CAM rests comfortably within the feminist movement which could pull women to use CAM (Gaylord, 1999). Women are drawn to use CAM because it offers an alternative to the patriarchal mainstream medicine, with its mostly female and holistic practices. Goldstein (2000) contends that one of the primary catalysts of the growth in CAM is the feminist movement which offers greater equality in the patient-practitioner relationship compared to traditional patient-practitioner relationships. All of these factors would indicate that being female is a strong predictor of CAM use. However, consistent findings on gender differences are not always documented. Indeed, some studies have found no statistically significant difference between the sexes and CAM use (Astin, 1998), whereas other studies have (Millar, 1997). Nevertheless, few research studies examine CAM by type,

which makes it difficult to know if more alternative types of CAM attract more females than males.

With regard to the educational level of CAM users, most research arrives at the same conclusion. People with more education are more likely to use CAM. Having a graduate degree, compared to a high school degree increases the likelihood of CAM use (Astin, 1998), and having a post-graduate education compared to not, also increases the chance of using CAM (Kelner & Wellman, 1997). Astin (2000) contends that a more educated person will (a) have greater exposure to CAM by reading popular or academic books, (b) educate themselves about chronic illness and the forms of treatment available for it, (c) be more likely to question the authority of conventional medicine and less likely to blindly accept what the medical doctor prescribes, and (d) be more likely to have larger incomes that enable them to use CAM that is not covered by health plans. Education, independent of health beliefs and income, appears to be a consistent predictor that is positively associated with CAM use.

Enabling Resources and CAM Use.

Income is an enabling factor of CAM use. In most cases, having a higher income increases the likelihood of CAM use (Eisenberg et al., 1993; McClennon-Leong, 1999). Typically, a person must pay out-of-pocket to use CAM. Some provinces offer subsidized payment for some CAM practices, such as chiropractic, but this is not a national policy. Canadians can access conventional health care services using the national medical plan and are not charged user fees, per se. Essentially, one can use mainstream medicine for "free". In contrast, CAM users pay out-of-pocket for treatments, or are reimbursed through extended health care insurance plans. The fact that

people are willing to pay "out of pocket" for CAM when they can access the conventional medical model for "free" was the primary finding noted by Dr. Eisenberg and colleagues (1993) in their report on the increased use of CAM therapies in the United States. They reported that approximately $13.7 billion dollars were spent annually on "unconventional therapies". This represents more than what was spent for out-of-pocket hospitalizations ($12.8 billion) in that year (Eisenberg et al., 1993, p. 246). Thus, income restricts access to CAM because it enables whether or not one can afford to pay for CAM services. Despite that fact that income is considered an enabling factor of CAM use, there are studies that show that income is not associated with CAM use (Astin, 1998, Wister et al., 2002). What this suggests is that income may not be as strongly associated with CAM use as predisposing characteristics such as education and gender.

Need Factors and CAM Use.

As outlined in the SBM, need, or illness factors, are either perceived or evaluated (Mechanic, 1978). Chronic illness, considered to be an evaluated need because a medical doctor most likely diagnoses the illness, is considered to be an important correlate of CAM use (O'Connor, 1995; Wister et al., 2002). Most CAM users with chronic illness consider their illnesses to be non-life threatening and state that their use of CAM is primarily for health maintenance after diagnosis of a serious condition (Lazar & O'Connor, 1997). Chronic illness typically motivates people to broaden treatment options, particularly if the conventional model has proven inadequate in meeting needs and quality of life issues (Lazar & O'Connor, 1997). Proponents of CAM feel that conventional medicine is acute care focused and is not appropriate for treating chronic illness (Kelner, 2000). Goldstein (2000) adds that medical doctors do not know as much

about chronic illness and symptom management as they should, and that the way the conventional medical system is structured limits the type and amount of care a person with chronic illness can seek. Time restraints and the heavy patient load associated with many general practitioner practices limits the amount of time and information that a patient can expect from their medical doctor. These constraints, along with the fundamental difference of how patients and practitioners interact in CAM relationships compared to conventional relationships has also been indicated as a reason why people with chronic illness seek out CAM (Kelner, 2000). Thus growing dissatisfaction with mainstream medicine as a means for treating chronic illness is stated as a primary reason why people go outside of the mainstream in search of illness management.

Pain can be considered a need factor because this component of the illness is perceived as interfering with function (Zola, 1977). Many people with pain are motivated to seek relief through health services. Consultation with medical doctors occurs more often for those with chronic pain than for those without pain (James & Large, 1992). Living with pain is difficult and if the conventional system cannot address the source of the pain, or relieve symptoms of the illness, treatment options are broadened (Lorenzi, 1999). CAM users often report limitation on function arising from pain and the chronic illness. One study found that 89% of CAM patients reported health problems with pain, inevitably affecting daily life (Kelner & Wellman, 1997). Pain, as a predictor of CAM use, has also been indicated in other studies (James & Large, 1992; McClennon-Leong & Ross-Kerr, 1999; Rao, Mihaliak, Kroenke, Bradley, Tierney & Weinberger, 1999).

Other need factors, such as perceived health status, influence CAM use. In a random sample of over one thousand Americans, Astin (1998) found a trend towards an increasing use of CAM with decreasing health status. This association has also been documented in other studies (Astin et al., 2000; Blais, 2000; Palinkas et al., 2000). A possible explanation for the relationship between poor health status and CAM use could stem from the relationship between pain and health. People with poor health usually have less success in managing their health-related problems, such as pain and restricted activity, and are probably more receptive to seeking alternative health care (Astin, 2000).

Not all research reveals an inverse relationship between CAM use and health status, though. One study found that 92% of alternative users rated their health as good, compared to 83% for family physician patients who also reported good health status (Kelner & Wellman, 1997). As noted earlier, of these CAM users almost 90% reported pain as the reason for seeking CAM. Although the authors did not comment on the contradiction between reporting pain, yet still considering one's health to be good, one could speculate that CAM use serves several functions for people. Those with poor health use CAM because mainstream medicine has not helped, and those with good health use CAM for health maintenance and prevention. Another explanation could be that they have not had success in treating chronic illness with an acute-care based approach to health and turn to CAM instead. In any case, the connection between pain, perceived health status and CAM use is one that this present research hopes to clarify.

This general overview of the predisposing characteristics, enabling resources and need factors of CAM use indicates that there are differences between users and non-users of CAM, and even between different types of CAM users. However, it is clear that

identifying the differences between CAM users is an understudied area of research. That is why this thesis will examine the differences among three groups of CAM users and bridge this gap in the research. In order to determine the strength of the identified predictors, an ideal research design would use a longitudinal approach. The next section will describe research that has used this method and identify how this study's method will be different.

2.5 Longitudinal Analyses of CAM Use

In an extensive literature search, only two research studies were found that examined CAM using longitudinal data (Blais, 2000; Astin, 2000). Blais (2000) used the example of midwifery in Quebec, Canada in the 1990s to show how the characteristics of users change as an alternative practice becomes more mainstream. Initial users of the alternative practice tend to be very different from non-users, but as the alternative practices become more accepted, the user profile starts to change. The more accepted the practice becomes, the more likely it is that the number of users increase and become more representative of the general population. In a comparison of two samples from the Quebec Health Survey in 1987 and 1993, Blais (2000) found that the demographics of the CAM users in the initial sample remained the same, five years later, and did not replicate those of the midwifery phenomenon. However, CAM use did increase in popularity between those time periods, as originally hypothesized. This study also showed that there was an increase in the diversity of CAM use, as well as a change in the reasons why visits were sought. Visits to CAM practitioners in the second time period tended to be for diagnostic and examination purposes, not just treatment-specific visits. As a result,

the CAM users in this study were becoming more diverse with time, rather than more similar as hypothesized.

Despite the contribution to CAM research that this longitudinal analysis makes, there are areas that Blais' (2000) research did not address. Blais (2000) did not consider health beliefs. This thesis will include health beliefs as a predictor of CAM use, in addition to health status and socio-demographic factors. Another limitation of Blais' (2000) research is that he used data collected five years apart. This length of time may be too long because it creates too much room for outside influences; consequently there is greater measurement error and false conclusions could be drawn. The systematic measurement error created by testing five years apart could include changes in the questionnaire format and interview techniques. Another source of measurement error could come from the way respondents define CAM. Changes to the health care system and insurance coverage, over the five years, could alter a person's perception of what constitutes a CAM. Furthermore, Blais' sample did not include panel data. This results in greater inter-individual differences between the two measurement times and inevitably increases the probability of spurious results. For example, the change in consultation between the two samples (i.e., more diagnostic and examination) is more likely a function of differences between the health status, age and gender of the two samples, rather than due to the impact of the outcome variable (CAM use). This thesis will address these limitations by reducing this type of measurement error and examining CAM use for the same group of people over a two-year period, rather than five-year intervals.

2.6 Hypotheses Development

How older adults fit into the push/pull theory of CAM use constitutes the primary research question driving this thesis. The lack of understanding of this question is primarily due to gaps in research on older adults and CAM use (Astin, 1998; Boisset & Fitzcharles, 1994). However, we can develop some competing arguments. On the one hand, older adults tend to suffer from chronic illness at greater rates than younger adults (Chappell, 1991), and are more likely to have had many years of experience with medical practitioners (Ford, 1986). Consequently, increased exposure to conventional medicine, which focuses on acute care, would certainly suggest that dissatisfaction with mainstream medicine could motivate an older adult to use CAM. On the other hand, an older adult who knows their illness better than most may have a greater responsibility for health and a desire to control health care decisions. Both of these situations could increase the likelihood that an older adult will use CAM, rather than rely on the doctor-guided/patient compliance associated with mainstream medicine. Other elements of an alternative ideology, such as spirituality, may also predict CAM use. A person with this ideology is more likely to use CAM because it is more in line with their holistic and spiritual philosophies.

A basic assumption of this research is that CAM users are not a homogenous group, and that different types of CAM lie on a continuum with different relationships to mainstream medicine. The difference between CAM and mainstream medicine are conceptualized as a continuum by looking at the professional differences between CAM and mainstream medicine based on the diagnostic and education practices associated with each and the licensing and regulation practices outlined by each profession.

Conceptually, the greater the distance along the continuum from mainstream medicine, the more alternative the CAM practice is and the greater the likelihood that each CAM will attract different types of users. Some CAM, such as chiropractic is closer to mainstream medicine, in part because of licensure, regulation and education requirements, and therefore is considered complementary or allied health practices. Other CAMs, like massage therapy, acupuncture, homeopathy and naturopathy, can be conceptualized as being further along the continuum and, therefore more alternative to mainstream medicine. These CAMs are more likely to have therapeutic modalities that are not offered, or condoned by mainstream medicine.

Based on a review of the theoretical and empirical research, this thesis outlines that CAM users are different from non-users, and more importantly are actually different from each other. The research also shows that health beliefs play an important role in predicting CAM use depending upon whether or not a person is pushed or pulled to use CAM. The gaps in the current understanding of CAM and the limitations of the CAM research to date were identified and outlined as areas that this thesis will address. In reaching these research objectives, and furthering our knowledge on CAM use and older adults, this thesis will examine two hypotheses:

1) Being disenchanted with medicine increases the probability that an older adult will use CAM. This association will be stronger for CAM that are considered to be further from mainstream medicine on the continuum.
2) Having an alternative ideology increases the likelihood that an older adult will use CAM and this association should be stronger for CAMs that lie further on the continuum from mainstream medicine.

Other predictors of CAM use such as predisposing characteristics, enabling resources and need factors will also be examined. The relationship between these predictors and chiropractic, massage therapy, and acupuncture/homeopathy/naturopathy use in 1998/99 will be used to describe the typical older adult user. The HBM and SBM will frame and operationalize the many predictors of CAM use. In addition to the cross-sectional component of this research, a longitudinal analysis will be employed. Longitudinal analysis is recognized as an important method of examining CAM use and for testing the above hypotheses. By using this type of methodology, the research will be able to show the strength of the push/pull health beliefs in predicting CAM use two years later.

Chapter Three: Methods

This chapter will include four sections. The first section will provide a general overview of the survey used in this thesis: the National Population Health Survey (NPHS). The next section will discuss sample design and sample characteristics, followed by a section that describes sampling weights and the way missing data were handled in this analysis. This chapter will conclude with a description of the dependent and independent variables used in this thesis.

3.1 The National Population Health Survey

The National Population Health Survey (NPHS) is a national survey that monitors the health status of Canadians. First undertaken in 1994/95[2], the NPHS has gone on to a second (1996/97), third (1998/99) and fourth (2000/01) cycle of health and health-related questions. The NPHS consists of both cross-sectional and longitudinal data. Statistics Canada intends on continuing the NPHS Longitudinal File for twenty years. The cross-sectional component of the NPHS was discontinued in 2000 and replaced with the Canadian Community Health Survey in 2000/01. The NPHS Longitudinal File was chosen for this thesis because it is the first health study of its kind to offer panel data on the health behaviour of Canadians, including measures of health care utilization and health beliefs. A panel is a set of individuals that is observed over time and measured at set intervals. Also, the NPHS has valid and reliable scales, as well as random sampling process and computer-assisted interview techniques.

[2] Statistics Canada collects data for the NPHS four times a year in order to represent four seasons for each cycle. As a result, the NPHS label for each cycle will represent two calendar years (e.g., June 1998, August 1998, November 1998 and February 1999 is labeled as 1998/99).

In order to access the NPHS LF master file of the panel data one must submit a proposal to Statistics Canada Research Data Centre. Once the proposal is approved by a Statistics Canada peer-review committee, the applicant is deemed a Statistics Canada employee. Employees must comply with security checks, and all of the regulations and procedures outlined by Statistics Canada in order to access the master files. These stringent security measures are in place to protect respondent privacy and right to confidentiality. Statistics Canada master files are housed at the Research Data Centres (RDC) across Canada, whereas public-use files are 'cleaned', meaning certain data has been suppressed in order to protect respondent confidentiality and to be accessible for the general public. The RDC is affiliated with post-secondary institutions as a part of the Statistics Canada Data Liberation Initiative; a federal initiative for universities and statisticians to share resources and information using federal and provincial data sets. All of the research for this thesis was undertaken at the British Columbia Interuniversity Research Data Centre on the University of British Columbia campus.

The NPHS LF contains two components: the survey of households and the survey of health care institutions. This thesis uses the household component of the NPHS. Households are selected at random from all provinces. Excluded from this random process are "populations on Indian Reserves and Crown Lands, residents of health care institutions, full-time members of the Canadian Armed Forces, and some remote areas in Ontario and Quebec" (Overview of the National Population Health Survey, Statistics Canada, 2002; pg 6). The household survey includes one person in each household over the age of 12. The majority of interviews (95%) were conducted on the telephone; the remaining 5% were conducted in person. All NPHS respondents were asked about their

health status, health service use, risk factors, chronic conditions and activity restrictions, as well as demographic and socio-economic factors. Follow-up interviews take place at two-year intervals, thus forming the longitudinal panel of the NPHS. Data collection occurs year round so that all four seasons are included. This reduces elements of measurement error caused by seasonal-influenced responses (e.g., increased physician visits during flu season), which may bias findings. All data were obtained through self-reporting; no respondent proxies were used for this thesis.

Each cycle of the NPHS has a new questionnaire that contains both core and focus content (see Appendix A for 1996/97, 1998/99 and 2000/01 questionnaires). Core content questions are repeated in each cycle and the questions do not change year to year. For example, core content questions about health status, functional ability, socio-demographics and labour force status are asked in each cycle. Focus content questions are in addition to the core questions and range in topic from mental health to lifestyle. Usually provinces or associations targeting a specific area sponsor these questions; consequently focus content questions that appear one year may not necessarily appear in the subsequent questionnaire. This creates a problem for panel analysis and will be discussed later as a methodological limitation.

3.2 Statistical Analyses and Design

This thesis uses bivariate and multivariate analyses to test the effect of the predictor variables on the outcome of CAM use for two time periods. In the bivariate analysis, cross-tabulations are used to determine whether there are differences within the three groups of CAM users outlined in this research. Chi Square statistics, specifically Kendall's tau b and tau c, are used to detect statistically significant associations among

the three dependent variables and the 10 independent variables. Kendall's tau b and tau c is the better measure to use when doing bivariate cross-tabulations, particularly when the data are ordinal (Lutz, 1983). Kendall's tau b is used when there is a 2X2 table. That is, when the analysis includes one dependent variable and an independent variable with two categories. Kendall's tau c can be used for any size tables, which is helpful when the independent variable has more than 2 categories. Both tau b and tau c statistics can range from 0 to +/-1. The tau statistics represent the magnitude of association, or correlation between the variables. The guide used to detect and describe association for the social sciences can be found in Figure 3 (adapted from Lutz, 1983). The majority of testing at the bivariate level is zero-order association, meaning only the association between two variables are examined, and not interactions.

This thesis uses logistic regression to determine the effects of health beliefs and other factors on the probability of using CAM either that same year, or two years later. Logistic regression is used for several reasons. First, this type of regression allows for the analysis of dichotomous variables often associated with health surveys (i.e., yes/no responses). In fact, logistic regression is considered the "standard method for regression analysis of dichotomous data in many fields, especially in the health sciences" (Hosmer & Lemeshow, 1989, p. vii). Second, logistic regression primarily makes estimates of the likelihood of a specific event occurring, compared to not occurring, for each category of an independent variable while controlling for all other variables. This is important when looking at health behaviour because health outcomes result from many factors. For instance, a person may be predisposed to use health services differently than others. Older adults tend to use health services at a greater rate than younger adults (Ford, 1986).

Third, very few studies control for illness and other need factors when examining CAM use. Need factors have consistently been shown to predict CAM use (Astin et al., 2000, Kelner & Wellman, 1997; Wister et al., 2002). By controlling for illness, this research will be able to isolate health beliefs and examine the influence of health beliefs on predicting CAM use.

In logistic regression, the beta coefficients are in log format. For easier interpretation logs can be transformed into an odds ratio by taking its exponential [exp(Bk)]. What results is an odds ratio which can be interpreted as the estimated factor change of a positive response for persons who are a unit apart on continuous variables (Xk), or compared to a reference category for categorical variables (DeMaris, 1995). When Exp (B) is more than 1, increasing values of the variable correspond to decreasing odds of the event's occurrence (Menard, 1995). For example, an odds ratio of 2.5 for gender means that being female, compared to male (reference category) increases the likelihood of using chiropractic by a factor of 2.5. The opposite is also true. When Exp (B) is between 1 and 0, decreasing values correspond to increasing odds of the event occurring (Menard, 1995). For example, an odds ratio of 0.5 for perceived health means that the likelihood of using chiropractic is decreased for those with fair or poor health compared to excellent/very good health by a factor of 0.5. All of the analyses in this thesis used SPSS 11.0 to compute statistics.

This thesis is comprised of two parts: a cross-sectional analysis and a longitudinal analysis. The cross-sectional analysis examines the rates of CAM use in 1998/99 based on measures drawn from that same survey year. Within the cross-sectional analysis, there are three separate analyses involving three dependent variables. The first analysis

examines chiropractic use, the second analysis examines acupuncture/homeopathy/naturopathy use, and the third analysis examines massage therapy use. All three dependent variables are measured in 1998/99.

For the longitudinal analysis, a different sample design is necessary. In the longitudinal analysis, CAM use is measured two years later (2000/01) and the outcome is based on variables drawn from the baseline year (1998/99). One longitudinal method is to examine the independent variables in one time period (1998/99) and measure the effect of these variables on the outcome at a second time period, in this case use of CAM two years later (2000/01). This thesis justifies using this basic longitudinal design due to the exploratory nature of this subject matter. It is recognized that all longitudinal analysis allows for potential measurement error between the two time periods (Plewis, 1985). However, using longitudinal methods produces less error when compared to cross-sectional analysis, hence, it is usually a preferred method for detecting the strength of variables in predicting outcomes over time and for studying changes related to aging (Plewis, 1985). With cross-sectional analyses it is difficult to disentangle age and cohort effects (e.g., a cohort effect could be erroneously attributed to age when in fact it is not due to the impact of being in a specific cohort), whereas longitudinal analyses permits interpretation and measurement of these effects by separating each effect.

Each logistic regression model is made up of four blocks encompassing ten independent variables. All of the independent variables are entered into the logistic regression models in steps, with each block of variables controlling for the previous block; thus hierarchical regression model development is employed. How variables are placed in the models is based on the research and empirical literature. Predisposing

characteristics are entered first in each block of the model. Age, sex and education, occur prior to the need to seek health service and predispose people to use health services differently (Mechanic, 1979). Need, a consistent predictor of health service use, is entered into block two. By placing need factors in block two of the regression model, illness can be controlled for. Most CAM studies indicate illness as the primary reason why people use CAM. Need, or illness factors prompt a person to seek health care depending upon overt symptoms such as pain and functional restriction (Wister et al., 2002), or subjective feelings of how healthy or unhealthy a person feels.

Health beliefs are entered into block three of the logistic regression models. Most of the literature classifies health beliefs as elements of predisposing characteristics, when looking at health service use. In Strain's (1990) study of health beliefs and older adults, health beliefs were classified as predisposing characteristics and entered into one block of a four block regression model. By doing so, Strain (1990) isolated health beliefs from the traditional predisposing characteristics, such as age, sex and education, in the hopes of illuminating the impact of beliefs on health service use. This research will also isolate health beliefs as one block of the regression model. However, this research will use the Health Belief Model as a framework in isolating the impact of health beliefs on predicting CAM use, rather than grouping health beliefs with predisposing characteristics. Income, an enabling factor, is entered last into the model due to the established finding that income enables or impedes access to health services (Anderson, 1995), particularly for CAM therapies (Astin, 2000).

Attrition

Attrition creates many problems in longitudinal data analysis (Korn & Graubard, 1999). In this thesis, attrition was dealt with by creating a filter that included only full responses from each of the four cycles of the NPHS. The initial panel, created in 1994, contains data from 17,276 randomly selected individuals with 13,582 remaining in cycle four. These individuals make up the complete panel, which are all panel members regardless of their response patterns in each of the four cycles. Statistics Canada defines a "Full/Complete Response" as including one of three types of respondents: (a) Panel Members (who provided a complete response to the interview); (b) Deceased Panel Members (death of a panel member is confirmed with Canadian Vital Statistics Database); (c) Institutionalized Panel Members (if institutionalized while in the panel study, the dataset is transferred to the NPHS Health Care Institution Survey). Each of these three types of respondents is given 'flags' which indicate a respondent's status. For this analysis, a filter was created to detect the respondent's flag and include only those respondents who provided full responses for each of the four cycles.

The overall response rate for the NPHS Longitudinal File is 84.8%. This is the average rate of response over the four cycles. Relative to other health surveys this is a high response rate (Korn & Graubard, 1999). The greatest amount of attrition took place in cycle one (9.3%) with each cycle having fewer attrition rates. Statistics Canada has very stringent sampling and interviewing techniques that ensure follow-up with each cycle. For example, only 3% of the longitudinal panel was lost to 'failure-to-trace' in cycle four and were unable to be found by interviewers even after numerous callbacks and letters were sent to the individual. Other strategies used by Statistics Canada to

ensure respondent participation include (a) reducing the number of interviews for each interviewer, which enables the interviewer to follow-up on non-contact cases, (b) the use of Computer Assisted Interview techniques, which increase the frequency of error-free interviews by prompting the interviewer to the next question, (c) having seniors supervisors follow through with refusals to encourage participation in a well-practiced manner.

3.3 Sample Characteristics

In order to isolate NPHS respondents over the age of fifty, all respondents born *after* 1948 (in cycle three, 1998/99) were excluded from this analysis. For example, a person born in 1950 was 48 years old in 1998/99 and therefore was excluded from the analysis. After attrition and ineligibility were dealt with, a sub-sample of Canadians aged fifty or older living in households was included for analysis (n=4,401). The 1994/95 panel was not used because questions about health beliefs were not available.

The sample is weighted to reflect the characteristics of the respondent panel that took part in the first cycle (1994/95) and also to protect the confidentiality of the respondents in the longitudinal panel. For example, there were 4,401 respondents in this analysis who were fifty years and older in 1998/99. When population based weights are applied, the sample reflects 11,906,991, almost 12 million Canadians aged fifty and older. For this thesis, population weights are used with the descriptive and bivariate analyses to adjust for the bias caused by over and under-sampling by age and sex. For easier reporting and interpretable statistical significance, the sample was re-scaled by a factor of .0583 to bring the population back to the original sub-sample size (n= 4,401).

In social science research, there is debate about whether regression models should use weighted data (see Winship & Radbill, 1994). This author follows Winship & Radbill's (1994) recommendation that population weights are not necessary with regression models if it can be shown that they do not make a difference in the results. Therefore, population weights are not applied to the logistic regression models. On the whole, the impact of using un-weighted versus weighted and re-scaled variables in this analysis would be minimal due to large sample size, and the resultant decrease in measurement error.

3.4 Measurement

Missing Data

A missing, or non-response value occurs in the data set when items of information are missing on an individual. Dealing with missing data requires a method of imputation. In most cases, when the amount of missing data is a trivial amount, mean and modal imputation can be used to correct any bias that missing data creates (Korn & Graubard, 1999). For this sample, there were very few missing cases for the majority of variables. Income, however, had quite a large number of missing cases (n=270) compared to the other dependent and independent variables (see Appendix B). According to Korn & Graubard (1999) this number of cases is less than 5%, which is an acceptable cut-off for modal imputation. Missing cases were corrected using modal and mean imputation methods and the creation of dummy variables.

Dependent Variables

The three dependent variables used to measure CAM use in 1998/99 and in 2000/01 were (1) chiropractic use, (2) massage therapy use, and (3) acupuncture and homeopathy/naturopathy use[3]. In the health care utilization section of the NPHS questionnaire (1998/99 and 2000/01), respondents were asked about their use of complementary and alternative practitioners. For the first dependent variable, chiropractic use, respondents were asked: "*In the past twelve months, how many times have you seen or talked on the telephone with a chiropractor about your physical/emotional or mental health*?" The responses are measured as scale variables ranging from 0 to 500. Respondents who said they had not contacted a chiropractor were coded as non-users (0), and those who saw a chiropractor one or more times in the last year are coded as users (1).

The next two dependent variables are measured in a similar way. Respondents were asked the following question: "*People also may use alternative and complementary medicine. In the past twelve months, have you seen or talked to an alternative health care provider, such as an acupuncturist, homeopath or massage therapist about your physical/emotional or mental health*?" A yes response prompts a list of alternative health care providers and respondents were asked to identify the type of CAM practitioner they contacted. Respondents who said yes they contacted massage therapist are considered users (1) and no they did not contact them are coded as non-users (0). Respondents who

[3] Initially, four types of CAM were analyzed: chiropractic, massage therapy, acupuncture and homeo/naturopathy. However, due to a small number of acupuncture and homeo/naturopathy users these categories were combined. Collapsing these dependent variables into one category was supported by the literature that finds people who use more alternative types of care are more likely to try other types (Kelner & Wellman, 1997). Thus, acupuncture users are considered to be more similar to homeopathic and naturopathic users than if acupuncture users were grouped with massage or chiropractic users.

said yes they contacted either an acupuncturist or a homeopath/naturopath are coded as users (1) and no they did not contact them are grouped together as non-users (0).

The weighted and re-scaled frequencies for chiropractic, massage therapy, and acupuncture/homeopathy/naturopathy use for the two survey years under examination are summarized in Figure 2.

Independent Variables

The measures for the predisposing, enabling and need factors of the sample are drawn from the 1996/97[4] and 1998/99 questionnaires and are hypothesized to influence CAM use in that same year (1998/99). Table 1 shows the weighted and re-scaled frequency distributions for each dependent variable and the 10 independent variables, representative of the Canadian population in 1994/95. For simplicity, the independent variables are listed according to how they are entered step-wise into the logistic regression models.

[4] Measures of spirituality were drawn from the 1996/97 questionnaire because questions about spirituality were not asked in earlier or later cycles. This is the only measure taken from the 1996/97 questionnaire.

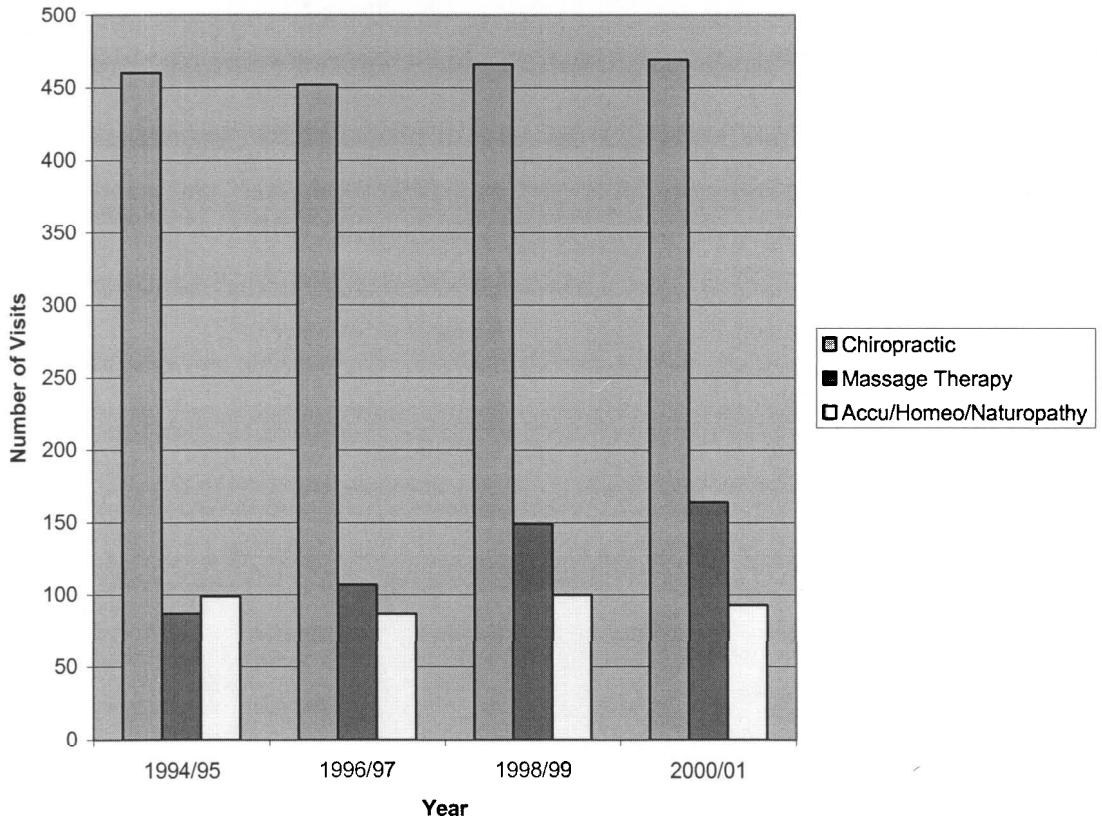

Figure 3. **Frequency of use for each CAM therapy for the panel of adults aged fifty and older, 1994 thru 2001.**

Table 1. Weighted & Rescaled Frequency Distributions for the Dependent and Independent Variables 1998/99 and 2000/01.

VARIABLES	CODING	FREQUENCY	VALID %
Dependent Variables:			
Chiropractic Use in 1998/99	0=no	3,935	88.1
	1=yes	466	11.9
Acupuncture/ Homeopathy/ Naturopathy Use in 1998/99	0=no	4,278	97.0
	1=yes	123	3.0
Massage Use in 1998/99	0=no	4,252	96.5
	1=yes	149	3.5
Chiropractic Use in 2000/01	0=no	3,869	87.9
	1=yes	532	12.1
Acupuncture/ Homeopathy/ Naturopathy Use in 2000/01	0=no	4,287	97.4
	1=yes	114	2.6
Massage Use in 2000/01	0=no	4,229	96.1
	1=yes	172	3.9
Independent Variables:			
Predisposing Characteristics:			
Age, in 1996	1=50-59	1,906	43.3
	2=60-69	1,311	29.8
	3=70-79	880	20.0
	4=80+	304	6.9
Sex	1=male	2,346	53.3
	2=female	2,055	46.7
Highest Education Level	1=Some Secondary/less	1,571	35.7
	2=Completed Secondary	599	13.6
	3=Post-Secondary	981	22.3
	4=Graduate Degree	1,250	28.4
Need Factors:			
Has a Chronic Condition	0=No	1,030	23.4
	1=Yes	3,371	76.6

VARIABLES	CODING	FREQUENCY	VALID %
Need Factors (continued):			
Self-Perceived Health			
	1=Excellent	744	16.9
	2=Very Good	1,571	35.7
	3=Good	1,430	32.5
	4=Fair	546	12.5
	5=Poor	106	2.4
Pain & Function	1=No pain	3,477	79.0
	2=Pain prevents few/ some activities	550	12.5
	3=Pain prevents most/ all activities	374	8.5
Health Beliefs:			
Unmet health care	1=yes	224	5.1
Needs	2=no	4,177	94.9
Spiritual Importance	1=very	880	20.0
in life	2=moderately	2,522	57.3
	3=not very	660	15.0
	4=not at all	339	7.7
Alternative Ideology	1=yes	819	18.6
	2=no	3,582	81.4
Enabling Resources:			
Total Household Income	1=>$19,999	1,215	27.6
	2=$20,000-39,999	1,298	29.5
	3=$40,000-59,999	814	18.5
	4=$60,000+	1,074	12.2

Note. Comorbidity is a scale variable. (X=2.5; SD=1.2).

Predisposing Characteristics: The socio-demographic variables include age, sex and education. Age is a continuous variable reflecting a person's year of birth. For example, if a person were born in 1910 he or she would be 86 years old in 1996 and would be included in the analysis. Age effects are of interest in this research, therefore, age is categorized according to age group. Four age groups were created: 50-59; 60-69; 70-79;

and 80 years or older. Education is categorized according to the highest level the respondent reported in 1998/99 and is placed in one of four groups (1=no secondary, 2=some secondary, 3=completed secondary, 4=college/university degree). The respondent's sex is coded as either female (2) or male (1).

Need Characteristics: Three elements of the illness context are measured: comorbidity, self-reported health status, and functional ability. Comorbidity is measured as the number of chronic illnesses a person reports, ranging from 0 to 30 illnesses[5]. Arthritis is the most common chronic illness with 34.9% of the panel reporting arthritis in 1998/99. The next most common chronic illness is high blood pressure (26.4%), followed by heart disease (10.1%) and diabetes (7.3%). The respondent's perceived health compared to others his or her own age is measured as: excellent=1; very good=2; good=3; fair=4; and poor=5. Pain and the level of activity restricted by pain is measured as 1=no pain; 2=pain restricts none or few activities; 3=pain restricts some or most activities.

Health Beliefs: There are three independent variables used to represent two health beliefs (medical disenchantment & an alternative ideology). Disenchantment with medicine is measured by responses from the following question, "*During the past 12 months, was there ever a time when you felt that you needed health care but you didn't receive it?*" A positive response indicates an unmet health care need and is considered to be a measure of disenchantment with medicine.

[5] A censored scale was created for the comorbidity measure when computing tabular analyses. This type of scale enables chi square statistics by avoiding cells with 5 or fewer cases. In the regression models, comorbidity was left as an interval scale measure.

The second health belief, an alternative ideology, is represented by two independent variables: personal responsibility for health and spirituality. Personal responsibility for health is measured by responses from five questions pertaining to self-care and health care decisions asked in the 1998/99 NPHS questionnaire (see Appendix C). Three of these five questions are used to create a scale that describes a person's beliefs about responsibility for health care decisions (standardized alpha reliability=. 61). Respondents are asked their opinion about the following: *"Patients should never challenge the authority of the doctor", "I prefer that the doctor assume all of the responsibility", "Better to go to a doctor than to try to treat yourself".* If a respondent states that they disagree[6], or strongly disagree with the three statements compared to agree, or strongly agree, this research considers the respondent to have personal responsibility for health, therefore an alternative ideology. Even though these statements are not direct measures of an internal locus of control they do address a personal desire to guide health care instead of relying on medical doctors. A key element of an alternative ideology is the belief that individuals must take responsibility for health (Goldner, 2000); which encompasses a " self-determined decision-making process" (Segall & Goldstein, 1989; p. 154). As such, this research is justified in considering questions about responsibility of health to be indicative of an alternative ideology.

Those who felt that they should be personally responsible for health care decisions, rather than doctors made up almost 19% of the panel. More than half of the

[6] This author recognizes that the outliers are lost when grouping responses and this may adversely affect results, however this limitation was overlooked for the purpose of parsimonious model development. Keeping the Likert scale in full version for each of the five self-care questions created a very large model with 15 reference categories for this health belief alone. Instead, strongly agree and agree were grouped together (1), neither disagree nor agree remained a single category (2) and, disagree and strongly disagree made up the third category (3).

panel (66%) disagreed with the statement that one should never challenge the authority of a medical doctor, while 11% had neutral feelings about the statement. Almost 73% of the panel strongly agreed, or agreed, that they prefer medical doctors who let them decide and another 55% of the panel felt it is better to go to a medical doctor than treat oneself.

The second independent variable to represent an alternative ideology is spirituality. Responses to the question "*Do you feel that spirituality and faith play important roles in life?*" are categorized as: very (1), moderately (2), not very (3), or not at all important (4). It is important to note that this independent variable is taken from cycle two (1996/97) because questions about spirituality are not asked in the 1998/99 or 2000/01 questionnaires. This thesis contends that it is appropriate to use an independent variable, like spirituality, because the importance of spirituality in life is not likely to change drastically from year to year.

Enabling Resources: Total household income from all sources is a derived variable made up of positive responses (yes=1) to six questions. The six questions asked respondents if his or her income is above or below a stated figure (e.g., >$20,000 or <=$20,000). Responses were grouped in four categories (1=>$19,999, 2=$20,000-$39,999, 3=$40,000-$59,999, 4=$60,000 +).

Chapter Four: Results

This chapter will present the results from the bivariate and multivariate analyses. The two hypotheses tested in this thesis will each be discussed in turn, followed by a general overview of the health beliefs and predictors of CAM use for older adults. Finally, focus will be placed on the longitudinal analysis of the panel data and health beliefs.

The first hypothesis is that CAM users will be more likely to report disenchantment with medicine (i.e., unmet health care needs) compared to non-users. This association is expected to be stronger for CAMs that are considered to be further from mainstream medicine on the continuum. The second hypothesis is that having an alternative ideology (i.e., spirituality and personal responsibility for health) increases the likelihood that an older adult will use CAM compared to not using CAM. This association is also expected to be stronger for CAMs that are more distant from mainstream medicine on the continuum, such as acupuncture, homeopathy and naturopathy. For the other predictors of CAM use, differences are expected between CAM users and non-users in terms of their predisposing characteristics (i.e., age, sex and education), enabling resources (income), and need factors (i.e., comorbidity, pain and perceived health). It is expected that these differences will be similar to those found in the literature on CAM use, yet a formal hypothesis is not made. Longitudinal analyses will be a method of testing the above two hypotheses and determining the strength of health beliefs and other factors in predicting CAM use two years later.

4.1 Bivariate Analysis

The results of the bivariate analyses are presented using the weighted longitudinal weights described in chapter three. The weighted data are a more effective form of reporting population characteristics when doing population research. For brevity, only first order associations were examined.

Measures Ranging from 0 to (+/-1)

Value of Measure	Interpretation
Zero	No Association
.01 to .25	Weak Association
.26 to .55	Moderate Association
.56 to .75	Strong Association
.76 to .99	Very Strong Association
1.0	Perfect Association

(adapted from Lutz, 1983)

Figure 4. Approximate Guide for Interpretations of Strength of Association

Hypothesis 1: Being disenchanted with medicine increases the likelihood of CAM use. This association will be stronger for CAMs deemed further from mainstream medicine.

Massage Therapy Users: *Disenchantment with medicine*, as measured by the perception that health care was needed but not received in 1998/99, results in a very weak positive association with massage therapy use (see Table2).

Table 2. Crosstabulation of Massage Therapy Use in 1998/99 and Unmet Health Care Needs

	Unmet Health Care Needs		
Massage Therapy Use In 1998/99	No	Yes	Total
No	6,223,242 96.7%	294882 92.5%	6518125 96.5%
Yes	209589 3.3%	23855 7.5%	23444 3.5%
Total	6432832 100.0%	318737 100%	6751569 100.0%

tau b.05, $p<.001$

Personal responsibility for health measured by a preference for guiding health care decisions rather than relying on medical doctors, also demonstrates a statistically significant association with massage therapy use, albeit weak (see Table 3).

Table 3. Crosstabulation of Massage Therapy Use in 1998/99 and Personal Responsibility

	Has a Personal Responsibility for Health		
Massage Therapy Use In 1998/99	No	Yes	Total
No	5386625 96.8%	1131501 95.4%	6518126 96.5%
Yes	178844 3.2%	54600 4.6%	233444 3.5%
Total	5565469 100.0%	1186101 100%	6751570 100.0%

tau b=.03, p<.001

There was a very weak positive association between massage therapy use and spirituality (see Table 4). As a person reports greater importance of spirituality to life the probability of using massage therapy increases (tau c=.02, p<.001)

Table 4. Crosstabulation of Massage Therapy Use in 1998/99 and Spirituality

Index of Spiritual Importance in Life

Massage Therapy Use in 1998/99	Not at all	Not very	Moderately	Very	Total
No	478443 96.8%	952860 97.8%	3795477 97.0%	1291345 94.3%	6518125 96.5%
Yes	15681 3.2%	21606 2.2%	117855 3.0%	78301 5.7%	233443 3.5%
Total	5565469 100.0%	974466 100.0%	3913332 100.0%	1369646 100.0%	6751568 100.0%

tau c=.02, p<.001

Chiropractic Users Like massage therapy use, chiropractic use in 1998/99 is associated with health beliefs at the bivariate level. Disenchantment with medicine demonstrates a very weak, but statistically significant positive association with chiropractic use (see Table 5).

Table 5. Crosstabulation of Chiropractic Use in 1998/99 and Unmet Health Care Needs

	Unmet Health Care Needs		
Massage Therapy Use In 1998/99	No	Yes	Total
No	5708320 88.7%	255532 80.2%	5963852 88.3%
Yes	724512 11.3%	63205 19.8%	787717 11.7%
Total	6432832 100%	318737 100.0%	6751569 100.0%

tau b=.06, p<.001

Having personal responsibility for health, a component of an alternative ideology, is also associated with chiropractic use in 1998/99, as shown in Table 6. Older adults who feel personal responsibility for health care decisions have a higher probability of using chiropractic. This association was weak, but positive (tau b=.03, p<.001).

Table 6. Crosstabulation of Chiropractic Use in 1998/99 and Personal Responsibility

	Has a Personal Responsibility for Health		
Chiropractic Use In 1998/99	No	Yes	Total
No	4939109 88.7%	1024743 86.4%	5963852 88.3%
Yes	626359 11.3%	161357 13.6%	787716 11.7%
Total	5565468 100%	1186100 100.0%	6751568 100.0%

tau b=.03, p<.001

Spirituality, an element of an alternative ideology, also demonstrates a statistically significant association with chiropractic use in 1998/99, albeit a very weak relationship (see Table 6).

Table 7. Crosstabulation of Chiropractic Use in 1998/99 and Spirituality

Index of Spiritual Importance in Life

Chiropractic Use in1998/99	Not at all	Not very	Moderately	Very	Total
No	445194 90.1%	867132 89.0%	3454506 88.3%	1197019 87.4%	5963851 88.3%
Yes	48930 9.9%	107334 11.0%	458826 11.7%	172627 12.6%	787717 11.7%
Total	5565469 100.0%	974466 100.0%	3913332 100.0%	1369646 100.0%	6751568 100.0%

tau c=.02, p<.001

Acupuncture/Homeopathy/Naturopathy Use The two health beliefs examined are both statistically significant for acupuncture, homeopathy and naturopathy use (other CAM). First, disenchantment with medicine (i.e., unmet health care needs) shows a moderate, positive association with the use of other types of CAM (see Table 8).

Table 8. Crosstabulation of Acupuncture/Homeo/Naturopathy Use in 1998/99 and Unmet Health Care Needs

	Unmet Health Care Needs		
Other CAM Use In 1998/99	No	Yes	Total
No	6269055 97.5%	296482 93.0%	6565537 97.2%
Yes	163777 2.5%	22255 7.0%	186032 2.8%
Total	6432832 100.0%	318737 100%	6751569 100.0%

tau b=.057, p<.001

Having a personal responsible for health also shows a weak statistically significant positive association with acupuncture, homeopathy and naturopathy use in 1998/99 (see Table 9). Thus, feeling personally responsibility for health (i.e., having an alternative ideology) increases the probability of using other types of CAM in 1998/99.

Table 9. Crosstabulation of Acupuncture/Homeo/Naturopathy Use in 1998/99 and Personal Responsibility

	Has Personal Responsibility for Health		
Other CAM Use In 1998/99	No	Yes	Total
No	5436844 97.7%	1128692 95.2%	6565536 97.2%
Yes	128624 2.3%	57408 4.8%	186032 2.8%
Total	5565468 100.0%	1186100 100%	6751568 100.0%

tau b=.06, p<.001

Spirituality[7], measured as either yes or no in response to the question "Is spirituality and faith important in life?" demonstrates a statistical signification positive association with acupuncture, homeopathy and naturopathy use, albeit very weak (tau b=.05, p.001).

4.2 Multivariate Analysis

The results from three cross-sectional multivariate analyses are presented in this section. As described in section 3.3, no weights are added to the multivariate analyses. There are three categorical dependent variables and nine independent variables used to test the two hypotheses. The first three analyses addressing the primary and secondary

[7] For the dependent variable acupuncture/homeopathy/naturopathy use a yes/no measure of spirituality was used. Using the scale of spiritual importance (i.e., very, moderately, not at all spiritual) as was used with the other two dependent variables creates a situation where the cell size was less than five. This situation is not conducive to Chi Square analysis, which requires cells to have a minimum of five cases per cell in order to detect the difference between the observed and predicted cases.

hypotheses examine CAM use in 1998/99 as predicted by nine independent variables from that same time period (1998/99) as well as one independent variable from 1996/97. Each of the three analyses is presented separately, beginning with the massage therapy model. For simplicity, and because there were only small changes to the standardized beta coefficients and strength of the odds ratio with the addition of each block, only the final block (block four) is presented for each logistic regression analysis. Logistic Regression Massage Therapy Use in 1998/99

As shown in Table 10, each of the 4 blocks as well as the overall model is statistically significant (Overall Model Chi-Square=158.55, $p<.001$). The predisposing characteristics, which are entered in block one, contribute 8.4% to the overall explained variance of the model (Naglekerke R^2=13.8%). Need characteristics entered in block two contribute 3.8% of explained variance, while health beliefs (block three) and enabling resources (block four) explain less than 1% each.

Table 10. Logistic Regression for Massage Therapy Use in 1998/99: Model Significance

	Block Chi-Square	Block Significance	Model Chi-Square	Model Significance
Model 1	96.15	.001	96.15	.001
Model 2	32.00	.001	128.14	.001
Model 3	17.76	.001	145.89	.003
Model 4	12.65	.005	158.55	.001

Disenchantment with medicine is not statistically significant in the first three blocks. Therefore, the hypothesized association between disenchantment with medicine and massage therapy use is not supported (see Table 11).

Table 11. Logistic Regression for Massage Therapy Use in 1998/99 and Independent Variables

	Block 4		
	B	S.E.	Odds Ratio
Sex (ref=male)	.97***	.23	2.65
Age Group			
50-59 years	1.3***	.44	3.65
60-69 years	.69	.45	-
70-79 years	-.01	.50	-
80+ years (ref)			
Education			
<Secondary/less (ref)			
Completed Sec.	.31	.31	-
Post-Secondary	.50*	.25	1.65
Graduate School+	.53*	.24	1.70
Comorbidity	.16***	.05	1.18
Pain & Functioning			
No pain (ref)			
Pain prevents few/ some activities	.54*	.26	1.71
Pain prevents most/ all activities	.69*	.30	1.99
Self-rated Health			
Excellent/v.good/good (ref)			
Fair/poor	-.36	.28	-
Disenchantment with Medicine (ref=no)	.49	.28	-
Alternative Ideology (ref=no)	.32	.19	-
Spiritual Importance in Life			
Very (ref)			
Moderately	-.52**	.19	.59
Not very	-.90**	.34	.41
Not at all	-.65	.42	-
Total Household Income			
<$19,999 (ref)			
$20,000-39,000	.62*	.25	1.85
$40,000-59,000	.51	.29	-
$60,000+	.945**	.28	2.58
Constant	-3.92	.30	.02

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

Of the two elements of an *alternative ideology* examined, only spirituality shows a statistically significant association with massage therapy use in 1998/99 (see Table 11). If a person reports being not very, or moderately spiritual compared to very spiritual they are less likely to use massage therapy (odds ratio=-.90, p<.01; odds ratio=-.52, p<.01 respectively). A personal responsibility for health does not predict massage therapy use, as hypothesized. In block three, however, the odds of using a massage therapist, compared to not increase by a factor of 1.45 for those who disagree, or strongly disagree that patients should never challenge the authority of doctors, that the doctor should assume all responsibility for health or that it is better to go to a doctor than to try to treat yourself (B=.37, odds ratio=1.45, p<.05). This association is not supported in the final block after income is entered into the model. This indicates that the relationship between massage therapy and having a personal responsibility for health is erroneous.

Of the *predisposing characteristics*, sex, age and education all demonstrate statistically significant associations with massage therapy use in the final model (see Table 11). Being female increases the likelihood of massage therapy use by a factor of 2.65 (B=.97, odds ratio=2.65, p<. 001). A massage therapy user is more likely to fall into the age group of 50 to 59 years of age, compared to 80 years and older by a factor of 3.65 (odds ratio=3.65, p<. 01), when controlling for all other variables. There is no association for age groups 60 to 69 and 70 to 79 years of age compared to being 50 to 59 years of age and massage therapy use. Education is statistically significant in the expected direction for two of the three categories in the final model, controlling for all other variables. Having completed secondary school, compared to not completing secondary school increases the odds of massage therapy use by a factor of 1.65, and

having a graduate degree, compared to not also increases the likelihood of massage therapy use by a factor of 1.70 (B=.49, odds ratio=1.65, p<.05; B=.53, odds ratio=1.70, p<.05 respectively). Being a high school graduate is not statistically significant for massage therapy use. All predisposing characteristics and their subsequent associations with massage therapy use are replicated in each of the four blocks.

The three measures of *need* for health services are comorbidity, functional ability due to pain, and perceived health. Comorbidity is measured as a continuous variable. With each increment increase on the comorbidity scale, the likelihood of massage therapy use also increases by a factor of 1.18 for each chronic illness reported (B=.16, odds ratio=1.18, p<.001). This association is replicated in each of the four blocks. Pain and functional ability also predict massage therapy use. A person who reports having pain that prevents none or few activities, compared to no pain is more likely to use massage therapy by a factor of 1.71 (B=.54, p<.05). This association is also evident for people who report pain that prevents some or most activities compared to no pain (B=.69, odds ratio=1.99, p<.05). Perceived health does not demonstrate a statistically significant association with massage therapy use in 1998/99 or for any of the four blocks when controlling for all other variables.

Income is a statistically significant predictor of massage therapy use. The probability of using massage therapy increases by a factor of 2.6 for those with annual household incomes between $20,000 and $39,999 compared to less than $20,000 per year (B=.95, p<.001). The odds of using massage therapy also increases by a factor of 1.9 for those with incomes greater than $60,000 per year compared to less than $20,000 (B=.62, p<.01).

Logistic Regression Chiropractic Use in 1998/99

As Table 12 shows, the final model for chiropractic use is statistically significant (Overall Model Chi Square=133.17, df=19, p<.001). The predisposing characteristics contribute 1.5% to the overall explained variance (Naglekerke R^2=6.1%). In block two, the need factors contribute the most to the overall explained variance and model strength with 3.4%. Health beliefs, entered in block 3, do not demonstrate a statistically significant relationship with chiropractic use yet when controlling for enabling resources in block four, a suppressor effect is evident and health beliefs now become statistically significant with chiropractic use. Enabling resources contribute less than 1% to the overall variance.

Table 12. Logistic Regression for Chiropractic Use in 1998/99: Model Significance

	Block Chi-Square	Block Significance	Model Chi-Square	Model Significance
Model 1	32.00	.001	32.00	.001
Model 2	75.95	.001	107.95	.001
Model 3	10.25	NS	118.19	.001
Model 4	14.98	.002	133.17	.001

Unmet health care needs (i.e., disenchantment with medicine) do not demonstrate a significant association with chiropractic use in 1998/99 (see Table 13). Thus, support for the hypothesis that being disenchanted with medicine would increase the likelihood of using chiropractic is not found in this study. In block three, having personal responsibility for health demonstrates a statistically significant association with chiropractic use (B=.32,

odds ratio=1.38, p<.008). This relationship is weaker in block four, the final model, yet still statistically significant overall (B=.32, odds ratio=1.34, p<.016). Personal responsibility for health predicts chiropractic use, but spirituality does not (see Table 13). A person was more likely to use chiropractic by a factor of 1.34 if they said that yes they have personal responsibility for health compared to not having this belief (odds ratio=1.34, p<.016).

Table 13. Logistic Regression for Chiropractic Use in 1998/99 and Independent Variables

Block 4	B	S.E.	Odds Ratio
Sex (ref=male)	-.14	.11	-
Age Group			
50-59 years	1.01***	.25	2.74
60-69 years	.98***	.25	2.65
70-79 years	.61*	.25	1.83
80+ years (ref)			
Education			
<Secondary/less (ref)			
Completed Sec.	-.05	.16	-
Post-Secondary	-.29*	.14	.75
Graduate School+	-.19	.13	-
Comorbidity	.2.0***	.03	1.22
Pain & Functioning			
No pain (ref)			
Pain prevents few/ some activities	.23	.15	-
Pain prevents most/ all activities	.51**	.18	1.67
Self-rated Health			
Excellent/v.good/good (ref)			
Fair/poor	-.64***	.17	.53
Disenchantment with Medicine (ref=no)	.23	.20	-
Alternative Ideology (ref=no)	.29*	.12	1.34
Spiritual Importance in Life			
Very (ref)			
Moderately	-.10	.13	-
Not very	-.26	.18	-
Not at all	-.21	.23	-
Total Household Income			
<$19,999 (ref)			
$20,000-39,000	.15	.14	-
$40,000-59,000	.50**	.16	1.65
$60,000+	.52**	.16	1.68
Constant	-2.64	.18	.07

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

Only age and education demonstrate statistically significant relationships with chiropractic use: sex is not a significant predictor, therefore, being female did not predict use of chiropractic (see Table 13). Older adults were three times more likely to use chiropractic in 1998/99 if they were between the ages of 50 and 59 compared to being 80 years and older (B=1.00, odds ratio=2.74, p<.001). This association is weaker, but still strong for ages 60 to 69 (B=.98, odds ratio=2.65, p<.001) and for ages 70 to 79 (B=.61, odds ratio=1.83, p<.05) compared to 80 years and older, controlling for all other variables. Thus, an inverse relationship between chiropractic use and age group is evident. Being younger, rather than older is a strong predictor of chiropractic use in 1998/99. For education, a person who completed secondary school compared to not completing secondary, or having no schooling, is less likely to use chiropractic (B=-.29, odds ratio=.75, p<.05). For the other two education categories there are no significant associations with chiropractic use in 1998/99 when controlling for all other variables. Education is not as strong a predictor of use for chiropractic as it is for massage therapy.

All three measures of need demonstrate statistically significant associations with chiropractic use. First, having more than one chronic illness increases the probability of chiropractic use by a factor of 1.22 for each increment increase in chronic conditions (B=.20, p<.001). Second, perceived health also predicts chiropractic use in 1998/99 when controlling for all other variables. Reporting excellent, very good or good health, compared to fair or poor health decreases the likelihood of chiropractic use by a factor of .53 (B=-.64, p<.001). In other words, if a person feels that his or her health is good they would be less likely to seek chiropractic care than a person who does not feel good about their health. Third, pain and functional ability also predict chiropractic use for this

sample. Having a lot of pain with many restrictions on function, compared to no pain and no restrictions increases the odds of chiropractic use by a factor of 1.66 (B=.51, odds ratio=1.66, p<.004). This association does not hold when comparing those with mild pain and some function restrictions to the reference category of no pain.

Total household income shows a statistically significant association with chiropractic use when controlling for all other variables. If a person reports a combined annual household income between $40,000 and $59,999, compared to under $20,000 per year the odds of using chiropractic are increased by a factor of 1.65 (B=.50, p<.001). This relationship is also evident when looking at those with household incomes greater than $60,000 per year compared to under $20,000 (B=.52, odds ratio=1.69, p<.001). Thus a positive association between higher income and chiropractic use is found.

Logistic Regression Acupuncture, Homeopathy & Naturopathy in 1998/99

The overall Model Chi-Square for acupuncture, homeopathy and naturopathy is statistically significant in predicting use based on 1998/99 variables (Model Chi Square=104.08, df=19, p<.001). Most of the variance in this CAM use model is explained by the predisposing characteristics in block 1, which account for 4.7% of the overall 12%. Need factors (block 2) contribute equally to the overall explained variance with 3.4% towards the overall explained variance. The health beliefs explain 2.4% of the variance in use while enabling resources also contributes 1.4% to the overall explained variance. The strongest block of the model used to predict acupuncture, homeopathy and naturopathy is the predisposing characteristics entered in block 1 (see Table 14).

Table 14. Logistic Regression for Acupuncture/Homeo/Naturopathy Use in 1998/99/: Model Significance

	Block Chi-Square	Block Significance	Model Chi-Square	Model Significance
Model 1	40.22	.001	40.22	.001
Model 2	34.44	.001	74.67	.001
Model 3	20.33	.001	94.99	.001
Model 4	9.08	.028	104.08	.001

All three categories used to measure spirituality show significant associations with use of other types of CAM (see Table 15). If a person feels that spirituality is not at all important compared to very important they are less likely to use acupuncture, homeopathy and naturopathy by a factor of .45 (odds ratio=-.79, $p<.001$). This positive association is also apparent for those who feel that spirituality is moderately important, compared to very important (odds ratio=-.68, $p<.05$) and somewhat important, compared to very important (odds ratio=.1.33, $p<.05$). Accordingly, as a person expresses greater levels of spirituality the odds of using other types of also CAM increase.

Of the three predisposing characteristics of CAM use, only education demonstrates a statistically significant relationship with use of acupuncture, homeopathy and naturopathy (see Table 15). If a person states that they had graduated from secondary school, compared to not graduating or no schooling, they were less likely to use other CAM by a factor of .30 (B=-1.21, $p<.05$). The other two categories of education (having some post-secondary, or a graduate degree), along with age and sex are not significant predictors of other types of CAM use.

All three measures of need show statistically significant associations with other types of CAM use in 1998/99. First, with each reported chronic condition acupuncture, homeopathy and naturopathy use increases by a factor of 1.22 (B=.20, p<.001). Second, perceived health also predicts acupuncture, homeopathy and naturopathy use. A person who perceives their health as excellent, very good or good compared to fair or poor is less likely to use acupuncture, homeopathy and naturopathy by a factor of .46 (B=-.77, p<.05). Third, pain and function also predicts acupuncture, homeopathy and naturopathy use. Reporting some pain, compared to none, increases the use of acupuncture, homeopathy and naturopathy by a factor of 1.82 (B=.60, p<.03), and having a lot of pain with major restrictions on function also increases the odds of acupuncture, homeopathy and naturopathy use by a factor of 2.45 (B=.90, p<.01), when controlling for all other variables.

Income also has a statistically significant association with the other types of CAM, but only for two of the three income categories. For instance, a person who reports income level of $20,000 to $39,999 compared to less than $20,000 has a greater likelihood of using other CAM by a factor of 2.05 (B=.72, p<.05). This association is also found when comparing incomes greater than $60,000 compared to less than $20,000 (B=.93, odds ratio=2.54, p<.01). Overall, income demonstrates a positive and statistically significant association with acupuncture, homeopathy and naturopathy use in 1998/99.

Table 15. Logistic Regression for Acupuncture/Homeo/Naturopathy Use in 1998/99 and Independent Variables

Block 4	B	S.E.	Odds Ratio
Sex (ref=male)	.36	.23	-
Age Group			
50-59 years	.99	.54	-
60-69 years	.92	.54	-
70-79 years	.47	.57	-
80+ years (ref)			
Education			
<Secondary/less (ref)			
Completed Sec.	-1.21*	.62	.30
Post-Secondary	.21	.29	-
Graduate School+	.47	.27	-
Comorbidity	.20***	.06	1.22
Pain & Functioning			
No pain (ref)			
Pain prevents few/ some activities	.60*	.28	1.82
Pain prevents most/ all activities	.90*	.34	2.45
Self-rated Health			
Excellent/v.good/good (ref)			
Fair/poor	-.77*	.35	.46
Disenchantment with Medicine (ref=no)	.53	.33	-
Alternative Ideology (ref=no)	.46*	.23	1.59
Spiritual Importance in Life			
Very (ref)			
Moderately	-.79**	.23	.45
Not very	-.68*	.35	.51
Not at all	-1.33*	.61	.27
Total Household Income			
<$19,999 (ref)			
$20,000-39,000	.72*	.30	2.05
$40,000-59,000	.66	.35	-
$60,000+	.930**	.34	2.54
Constant	-4.53	.38	.011

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

Logistic Regression: Longitudinal Analysis of CAM Use.

For all three dependent variables (massage therapy, chiropractic, and acupuncture/homeopathy/naturopathy use) the models used to describe each of the dependent variables in 2000/2001, based on 1998/99 predictor variables are relatively robust. Each of these three models will be discussed beginning with the model used to predict massage therapy use in 2000/01 based on an older adult's health beliefs, predisposing characteristics, enabling resources and need factors measured in 1998/99.

Logistic Regression Massage Therapy Use in 2000/2001

The overall model chi square for massage therapy use in 2000/01 as predicted by variables measured two years earlier is statistically significant (Model Chi Square=142.64, df=19, p<. 001). This model is slightly less than the cross-sectional model for massage therapy use in 1998/99 predicted by independent variables from that same year (model Chi Square=158.55, df=19, p<. 001). Therefore it is still a robust model two years later (see Table 16).

Table 16. Logistic Regression for Massage Therapy Use in 2000/2001: Model Significance

	Block Chi-Square	Block Significance	Model Chi-Square	Model Significance
Model 1	92.91	.001	92.91	.001
Model 2	29.15	.001	122.06	.001
Model 3	11.74	.038	133.80	.001
Model 4	8.83	.032	142.64	.001

Specifically looking at the associations between massage therapy use in 2000/01 and the predictor variables from 1998/99 there are changes between the two sequences (see Table 17). Most of the predisposing characteristics are replicated, however more of an age effect is observed in the longitudinal analysis. In 2000/01, being 60 and 70 years of age compared to 80 years and older increases the odds of massage therapy use by a factor of 2.4 ($B=.87$, $p<.05$). This relationship is in addition to the age replication carried over from the cross-sectional analysis. A person is more likely to use massage therapy if they are between the ages of 50 and 60 years compared to being 80 and older. Gender and education associations with massage therapy use are also reproduced two years later. Overall, the predisposing characteristics continue to contribute substantially to the overall explained variance with 7.7% of the overall 11.7% variance explained by these characteristics. None of the health beliefs are statistically significant two years later.

For the need factors having one or more chronic illness and reporting pain that disrupts function continue to demonstrate significant associations with massage therapy use two years later. What is new, however, is that perceiving one's health as excellent or good, compared to fair or poor decreases the likelihood that massage therapy is used in 2000/01 by a factor of .43 ($B=-.85$, $p<.01$). This association is not found in 1998/99. The need factors contribute 2.3% to the overall explained variance, which is less than the 3.8% explained in the cross-sectional analysis of massage therapy use. Income as an enabling resource does not change between the two sequences and continues to contribute less than 1% to the overall explained variance in predicting massage therapy use in 2000/01.

Table 17. Logistic Regression for Massage Therapy Use in 2000/01 and 1998/99

Independent Variables

Block 4	B	S.E.	Odds Ratio
Sex (ref=male)	.90***	.20	2.45
Age Group			
50-59 years	1.17**	.44	3.23
60-69 years	.87*	.45	2.38
70-79 years	.27	.48	-
80+ years (ref)			
Education			
<Secondary/less (ref)			
Completed Sec.	.50	.30	-
Post-Secondary	.82***	.24	2.28
Graduate School+	.66**	.24	1.94
Comorbidity	.11**	.05	1.12
Pain & Functioning			
No pain (ref)			
Pain prevents few/ some activities	.62**	.23	1.86
Pain prevents most/ all activities	.89**	.28	2.43
Self-rated Health			
Excellent/v.good/good (ref)			
Fair/poor	-.85**	.30	.43
Disenchantment with Medicine (ref=no)	.51	.28	-
Alternative Ideology (ref=no)	.31	.18	-
Spiritual Importance in Life			
Very (ref)			
Moderately	-.12	.20	-
Not very	-.44	.31	-
Not at all	-.85	.49	-
Total Household Income			
<$19,999 (ref)			
$20,000-39,000	.45	.24	-
$40,000-59,000	.57*	.27	1.76
$60,000+	.75**	.26	2.12
Constant	-3.80	.30	.02

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

Logistic Regression Chiropractic Use in 2000/2001

As shown in Table 18, the overall model Chi Square for chiropractic use in 2000/01, as predicted by variables from 1998/99, is 101.39 (df=19, p<. 001). This model is weaker than the overall model for chiropractic use in 1998/99 (Model Chi Square=133.17, df=19, p<.001), yet still holds up well between the two time periods. Overall, 4.6% of the variance in chiropractic use is explained by the predictor variables measured in 1998/99 (Naglekerke R^2=.046). Predisposing characteristics explain 1.2% of the overall variance, need factors contribute 1.6% in explaining use, health beliefs and enabling resources contribute less than 1% each.

Some notable differences between the two models are found when examining health belief variables in block 3. In 1998/99, feeling personally responsible for health demonstrates a statistically significant relationship with chiropractic use in the final model. A person with this health belief is more likely to use chiropractic in that same year. Two years later, in 2000/01, health beliefs demonstrate a statistically significant relationship with the overall model (Chi square=14.01, df=19, p<.016). In contrast, this same block of variables is not statistically significant in 1998/99. In the longitudinal analysis, the need factors contribute less than half to the explained variance of the overall model. Thus, block two in 2000/01 does not replicates the block's performance in 1998/99. Overall then, the difference between the final model Chi Squares can be attributed to the changes that take place in block two (need factors) of the model used to predict chiropractic use in 2000/01.

Table 18. Logistic Regression for Chiropractic Use in 2000/01: Model Significance

	Block Chi-Square	Block Significance	Model Chi-Square	Model Significance
Model 1	25.10	.001	25.10	.001
Model 2	35.02	.001	60.12	.001
Model 3	14.01	.016	74.13	.001
Model 4	27.18	.001	101.31	.001

Turning to the final model, most of the associations in the cross-sectional analysis of chiropractic use are duplicated in the longitudinal analysis (see Table 19). The age effect that is in the 1998/99 model is reduced somewhat in the 2000/01 model. Being between the ages of 70 and 79 compared to 80 years and older does not predict chiropractic use, whereas in 1998/99 it did. However, the general trend of being younger, rather than older, and using chiropractic is replicated in 2000/01. Education no longer has a statistically significant association with chiropractic use in 2000/01, although this relationship in 1998/99 was weak at best to begin with.

For the need factors in block two, comorbidity, perceived health and pain continue to demonstrate statistically significant relationships with chiropractic use (B=.11, odds ratio=1.12, p<.001; B=-.51, odds ratio=.61, p<.001; B=.5, odds ratio=1.65, p<.01 respectively). An interesting change between 1998/99 and 2000/01 is that in 2000/01 having mild pain with some restrictions on activity, compared to no pain increases the likelihood of chiropractic use by a factor of 1.3 (B=.32, p<.03) controlling for all other variables. This category of pain does not demonstrate a statistically significant relationship with chiropractic use two years earlier.

Table 19. Logistic Regression for Chiropractic Use in 2000/01 and 1998/99 Independent Variables

Block 4	B	S.E.	Odds Ratio
Sex (ref=male)	.13	.11	-
Age Group			
50-59 years	.64**	.22	1.90
60-69 years	.51*	.22	1.66
70-79 years	.37	.23	-
80+ years (ref)			
Education			
<Secondary/less (ref)			
Completed Sec.	-.24	.17	-
Post-Secondary	-.17	.14	-
Graduate School+	-.21	.13	-
Comorbidity	.11***	.03	1.12
Pain & Functioning			
No pain (ref)			
Pain prevents few/ some activities	.32*	.14	1.37
Pain prevents most/ all activities	.50**	.18	1.65
Self-rated Health			
Excellent/v.good/good (ref)			
Fair/poor	-.51	.17	.60
Disenchantment with Medicine(ref=no)	.10	.21	-
Alternative Ideology (ref=no)	.17	.12	-
Spiritual Importance in Life			
Very (ref)			
Moderately	-.34**	.12	.71
Not very	-.44*	.17	.65
Not at all	-.64**	.25	.53
Total Household Income			
<$19,999 (ref)			
$20,000-39,000	.62*	.25	1.85
$40,000-59,000	.51	.29	-
$60,000+	.95**	.28	2.58
Constant	-2.44	.18	.09

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

With respect to health beliefs, some notable differences occur between the two time sequences. In 1998/99, feeling personally responsible for health increases the odds of using chiropractic, yet this relationship disappears in 2000/01. Instead, being a little bit, somewhat or very spiritual, compared to not, decreases the likelihood of chiropractic use for all three categories (odds ratio=.71, p<.01; odds ratio=.64, p<.01, odds ratio=.529, p<.01 respectively). It is important to note that block 3 only contributes less than 1% of the overall 4.6% explained variance so this finding must be interpreted with caution.

The association between having higher income and using chiropractic in 1998/99 is duplicated in 2000/01. Having an income between $20,000 and $39,999 compared to under $19,999 increases the odds of chiropractic use in 2000/01 by a factor of 1.3 (B=.28, p< .04), controlling for all other variables. This new association is in addition to the 1998/99 finding that having an income greater than $40,000 increases the odds of using chiropractic; therefore the importance of income in predicting chiropractic use is strengthened in the longitudinal analysis.

Logistic Regression Acupuncture, Homeopathy & Naturopathy Use in 2000/01

The overall model Chi Square for acupuncture/homeopathy/naturopathy use in 2000/01 does not retain its strength when compared to the 1998/99 model (see Table 20). In fact, in 2000/01 the overall model Chi Square is less than half of the 1998/99 overall model Chi Square (Overall model chi-square=56.44, df=19, p<.001). Most of the differences in model strength can be attributed to changes in block 1 (predisposing characteristics) and block 2 (need factors). In 2000/01, only 6.9% of the overall explained variance of acupuncture/homeopathy/naturopathy use is explained by the independent variables measured in 1998/99 (Nagelkerke R Square=.07) This percentage

is lower than the 12% of variance explained in the 1998/99 model (Nagelkerke R Square=.12). Overall, the model used to measure other types of CAM use in 2000/01, based on predictor variables in 1998/99 does not hold up well between the two sequences. The predisposing characteristics explain 2.4% of the overall variance, while the need factors explain 1.7%. Both health beliefs and enabling resources contribute less than 1% each in explaining the overall variance in use.

Table 20. Logistic Regression for Acupuncture/Homeo/Naturopath in 2000/2001: Model Significance

	Block Chi-Square	Block Significance	Model Chi-Square	Model Significance
Model 1	19.22	.008	19.22	.008
Model 2	14.45	.006	33.67	.001
Model 3	17.98	.013	51.64	.001
Model 4	4.80	NS	56.44	.001

Turning to the health beliefs and other predictor variables in the final model (see Table 21) only a few associations are replicated between the two sequences. These results should be interpreted with caution, however, due to the poor strength of this model in predicting other types of CAM use in 2000/01 based on 1998/99 predictor variables. Of the three health beliefs measured, disenchantment with medicine is the only health belief that does not demonstrate an association with acupuncture/homeopathy and naturopathy use. Spirituality and personal responsibility for health, however, remain significant predictors of other CAM use in the longitudinal analysis.

Table 21. Logistic Regression for Acupuncture/Homeo/Naturopathy Use in 2000/01 and 1998/99 Independent Variables

Block 4	B	S.E.	Odds Ratio
Sex (ref=male)	.42	.24	-
Age Group			
50-59 years	.13	.42	-
60-69 years	-.05	.42	-
70-79 years	-.11	.44	-
80+ years (ref)			
Education			
<Secondary/less (ref)			
Completed Sec.	.45	.37	-
Post-Secondary	.45	.31	-
Graduate School+	.52	.30	-
Comorbidity	.17**	.06	1.18
Pain & Functioning			
No pain (ref)			
Pain prevents few/ some activities	.20	.31	-
Pain prevents most/ all activities	.36	.37	-
Self-rated Health			
Excellent/v.good/good (ref)			
Fair/poor	-.31	.35	-
Disenchantment with Medicine (ref=no)	.44	.36	-
Alternative Ideology (ref=no)	.50*	.24	1.65
Spiritual Importance in Life			
Very (ref)			
Moderately	-.79***	.24	.45
Not very	-.64	.36	-
Not at all	-.47	.46	-
Total Household Income			
<$19,999 (ref)			
$20,000-39,000	.29	.29	-
$40,000-59,000	.25	.36	-
$60,000+	.71*	.33	2.04
Constant	-3.88	.34	.02

*p<.05. **p<.01, ***p<.001

For instance, preferring to be responsible for health compared to not, increases the odds of using acupuncture/homeopathy and naturopathy by a factor of 1.65 (B=501, p<.05). This means, an older adult is almost two times more likely to use other types of CAM if they prefer to guide their own health care. Spirituality does not have as strong a relationship with acupuncture/homeopathy and naturopathy in the longitudinal analysis compared to the cross-sectional analysis. Only the category of not at all spiritual compared to very spiritual decreases the likelihood of other types of CAM use in 2000/01. In the cross-sectional model, all three categories of spirituality demonstrate significant associations. What this indicates is that the spirituality variable is not robust in measuring other types of CAM use two years later.

In 2000/01, education is no longer a statistically significant predictor of other CAM use (although in 1998/99 this was a weak association). For the need factors, chronic illness remains a statistically significant predictor of other CAM use. With each increase in the number of chronic illnesses reported, the likelihood of using acupuncture/homeopathy and naturopathy increases by a factor of 1.18 (B=.168, p<.01). Income, although not statistically significant as a block when entered into the final model, does demonstrate a significant relationship with acupuncture/homeopathy and naturopathy when controlling for all other variables. Having an annual income greater than $60,000 compared to less than $19,999 increases the likelihood of acupuncture/homeopathy and naturopathy use by a factor of 2.04 (B=.714, p<.05).

Logistic Regression Summary: A Comparison Across the Continuum of CAM.

This section will summarize and compare the results from the cross-sectional and longitudinal analyses. The primary contention of this thesis is that being disenchanted with medicine or having an alternative ideology increases the likelihood of CAM use. This association will be stronger for CAMs deemed further from mainstream medicine.

Health Beliefs

Two components of an alternative ideology, spirituality and personal responsibility for health show very weak associations with chiropractic and acupuncture/homeopathy/naturopathy use, but not massage therapy. An older adult who believes in having personal responsibility for health is more likely to use chiropractic and acupuncture/homeopathy/ naturopathy compared to an older adult who does not share these beliefs. In the longitudinal analysis, only acupuncture/homeopathy/naturopathy use retains a significant association with personal responsibility for health, albeit very weak. Unmet health care needs did not predict CAM use in this study.

Spirituality predicts massage therapy and acupuncture/homeopathy/ naturopathy use in the cross-sectional analysis, but not chiropractic. If an older adult reports being very spiritual, or moderately spiritual compared to not, they are more likely to engage in either massage therapy or acupuncture/homeopathy/naturopathy use. In the longitudinal analysis, spirituality no longer predicts massage therapy use. Surprisingly, all three categories of spirituality become statistically significant predictors of chiropractic use two years later. The association between spirituality and acupuncture/homeopathy/naturopathy use also remains in the longitudinal analysis, however the association is weaker. Overall, the findings on health beliefs should be

interpreted with caution due to the very weak associations between the predictor and outcome variables. Of the three groups of CAM examined in this study, the health beliefs explain 2.4% of the overall variance in acupuncture/homeopathy/naturopathy use, whereas the health beliefs explain only 1% and 1.5% of the variance in chiropractic and massage therapy use respectively.

Predisposing Characteristics

Sex is a predictor of massage therapy use only. Females are more likely than males to use massage therapy. However this relationship is not supported in the longitudinal analysis. Age effects were not found for acupuncture/homeopathy and naturopathy use. Being younger, rather than older increased the likelihood of massage therapy and chiropractic use in the cross-sectional analysis. This association was strong for massage therapy, particularly for those aged 50-59 compared to 80 years of age. This association remains strong in the longitudinal analysis.

Education is a moderate predictor of all three types of CAM in the cross-sectional analysis. For massage therapy, there is a positive association between education and massage therapy use. The more educated a person is the more likely they are to use massage therapy. Education was in the expected direction for chiropractic use. This weak effect disappears in the longitudinal analysis, as does the weak association between education and acupuncture/homeopathy/naturopathy use.

Need factors

All three measures of need in this study demonstrate significant associations with each of the three groups of CAM. Most of these associations are in the expected direction, however perceived health status is not. Perceiving your health as excellent

compared to poor *decreases* the likelihood of chiropractic and acupuncture/homeopathy/naturopathy use. This is in contrast to what this study hypothesized. In the longitudinal analysis, the association between acupuncture/homeopathy and naturopathy use and perceived health status disappears. Massage therapy use is not predicted by perceived health status in both the cross-sectional and longitudinal analyses. Comorbidity is the only consistent predictor of all three types of CAM in both analyses. With each increase in the number of chronic illness an older adult has, the more likely that one of the three groups of CAM is used.

Pain and functional ability also predict all three groups of CAM use in the cross-sectional analyses. A positive relationship is demonstrated for each group. As pain levels increase, the greater the likelihood each of the CAMs is used. In the longitudinal analysis, however, pain no longer demonstrates a significant association with acupuncture/homeopathy/naturopathy use. Overall, need factors contribute the most to the explained variation in chiropractic use (3.4%). In other words, of the four blocks used to model chiropractic use need (block 3) contributes the most to explaining the variation in use. Both massage therapy and acupuncture/homeopathy/naturopathy demonstrate similar rates in explaining variation in use due to need factors

Enabling Resources

For all three groups of CAM, income is a moderate to weak predictor of use in the expected direction. Higher incomes increase the probability for each CAM. These findings are retained in the longitudinal analysis. Overall, however, these findings remain weak at best. Less than 1% of the explained variance of each type of CAM is

explained by income as an enabling resource. This indicates that there are other factors, besides income, that act to enable or hinder CAM use for older adults.

Chapter Five: Discussion

The primary purpose of this thesis was to examine older adults' health beliefs and their use of CAM. Several current trends in health care, its use, and delivery warrant the need for investigating this topic. This thesis addresses two trends evident today: an increase in the use of holistic medicine, known as CAM; and a shift in health care consumers' beliefs to one of dissatisfaction with mainstream medicine and a desire for holistic therapies. A parallel trend is that not only is CAM use increasing, but also more and more people are using different types of CAM. In order to address these trends and the relationship between older adults and CAM use, several complex analyses based on the hypothesis that health beliefs predict CAM use, were undertaken.

Conceptually, health beliefs have been deemed to operate as either push or pull factors. Motivating factors, such as being disenchanted with medicine due to unmet health care needs, could push older adults to use CAM if mainstream medicine does not satisfy them. This effect was expected to be stronger for older adults who use CAM deemed further from mainstream medicine. Other motivating factors, like having an alternative ideology could pull people to use CAM because it is more in line with their spiritual and holistic beliefs and desire to guide health decisions. Again, this association was expected to be stronger for older adults who use more alternative types of CAM, like acupuncture, homeopathy and naturopathy, all deemed further from the mainstream. The second part of this thesis examined the many predictors of CAM use and used the SBM as a framework for organizing these predictors into predisposing, enabling and need factors. By doing so, this thesis was able to identify which of these factors contributed the most to CAM use. In order to detect the strength of these predictors and health

beliefs in determining CAM use two years later, a longitudinal analysis using panel data was employed.

This research has begun the difficult task of conceptualizing CAM use and developing a model to describe it. This study also contributes to understanding how older Canadians use CAM. To date, few Canadian studies have examined older adults, whether or not they use CAM, and what types of CAM they use. Furthermore, few, if any studies have moved beyond the descriptive stage of CAM research, and even fewer studies have used panel data to study CAM use. This research recognized a large gap in the research on CAM use and addressed it by examining health beliefs in the context of several trends: increasing use of CAM, alongside an increase in the diversity of CAM being used and an increase in unmet health care needs. Furthermore a desire for holistic health practices and a personal responsibility for health care can also be considered a trend contributing to CAM use.

Older Adults and CAM Use

The use of all three groups of CAM increased slightly for this panel between 1998/99 and 2000/01. Chiropractic was the most commonly used CAM, which is consistent with other studies of older adults that show rates of chiropractic use in the range of 11% (Foster et al., 2000) to 20% (Astin et al., 2000). The present research found chiropractic use to be on the lower end of this range. However, this research is a population-based study similar to Foster and colleagues (2000), whereas Astin and colleagues (2000) examined CAM use specific to older adults living in California. Research indicates that CAM use in general is higher on the West Coast than elsewhere in North America (Astin, 2000), so Astin et al., (2000) may have inflated rates of use.

For massage therapy, acupuncture, homeopathy, naturopathy use, the rates of use were quite low, on average, for this panel. The majority of studies on CAM use do find that these types of CAM are used less frequently than chiropractic (Astin et al., 2000; Foster et al., 2000). There is very little CAM research reviewed for this study that indicates rates of use of these types of CAM by older adults. Thus, this research is able to contribute to the growing body of literature on the types of CAM used by older adults and identify that the rates of use differ among CAM types.

One of the reasons why massage therapy and acupuncture, homeopathy and naturopathy are not as frequently used as chiropractic could be that older adults may gravitate towards therapies that have been readily accepted by the mainstream, such as chiropractic (Foster et al., 2000). CAM therapies such as massage and acupuncture offer different modalities than those offered by conventional medicine and may be considered foreign and unsafe by older adults. One could speculate that the user profile associated with the less-used CAM therapies is based on a myth that has yet to be dispelled for this age group. Older adults may consider massage therapy, acupuncture, homeopathy and naturopathy to be too unconventional and used only by the 'fringe' of society. Chiropractic, on the other hand, is a licensed and regulated profession and considered legitimate by seniors (Wellman et al., 2001). This may be a cohort effect, rather than an age effect because young-older adults are using CAM more than their older counterparts. As young-old adults become more exposed to CAM these lesser-known CAM therapies may increase in use.

Demographic Characteristics, Health Status and Use of CAM

The results from this study indicate that older adults are predisposed to use different types of CAM in terms of age, sex and education. The demographic profile of the older adult CAM user is consistent with the majority of research (Astin, et al., 2000; Foster et al., 2000; Wellman et al., 2001). Typically, the CAM user is younger and relatively highly educated with greater likelihood of having a graduate degree. In this study, age effects were found for massage therapy and chiropractic use; being younger, rather than older predicted use for these two types of CAM, and being female predicted massage therapy use only. It would seem that females are more likely than males to use massage therapy, which indicates that there is something in the massage consultation that appeals to females. Without knowing why a person uses a particular CAM therapy, it is difficult to speculate whether or not females are more attracted to the holistic and personal experience associated with massage therapy than males. One possibility is that older females are more likely to have arthritis (Ford, 1986). Massage therapy is indicated as a popular CAM choice for people with arthritis, more so than chiropractic (Ramsey, Spencer, Topolski, Belza & Patrick, 2001). Another interpretation could be that males are less likely to feel comfortable with the hands-on approach that is central to massage therapy and may not seek out that type of CAM for. The present research did not examine chronic illness type and CAM choice so it is difficult to ascertain this from the findings, however there is a good likelihood that females are more likely to use massage therapy arising from need due to illness.

Higher income increases the probability of using each type of CAM. This was an expected finding given that the majority of people who use CAM must pay-out-of pocket

to do so. Education is also a predictor of CAM use in this study. This relationship held while controlling for income. One explanation as to why more educated older adults use CAM may be that educated people tend to be more critical of conventional services and have more knowledge about alternatives to mainstream medicine (Astin, 2000; Furnham & Vincent, 2000). Furthermore, interest in health promoting behaviour is a trait often associated with highly educated people. Research on health service use indicates that highly educated people tend to be more active in health care decisions and claim personal responsible for health (Cockerham, Kunz, Leuschen & Spaeth, 1986). As a person becomes more educated, their ability to critically evaluate health and factors impacting health tends to increase (Mechanic, 1992). An older adult with a graduate degree, for example, is more likely to critically evaluate the medical encounter in terms of how the satisfied they are with the medical doctor, or skeptical of the treatment approach offered by the allopathic system. In contrast, a person that is less educated would be more likely to be passive in the health care encounter and more likely to accept the terms of the encounter without questioning or evaluating it (Astin, 2000). Thus it is reasonable to speculate that highly educated people will seek out alternative care if evaluations of the allopathic model are not favourable.

The findings from this study provide further support for the relationship between education and CAM use for older adults, although not for all types of CAM. The fact that chiropractic and acupuncture/homeopathy and naturopathy demonstrate weak negative associations with education could be explained by the fact that the measure of education used in this study examines formal education levels only and ignores other elements of education such as reading up on health and CAM therapies, or by joining

support groups for specific chronic illnesses. Attending arthritis self-care management groups is one example of how an older adult can become more educated about health, regardless of that persons' highest level of education received. In fact, people who are informed about their chronic illness, compared to not informed, are almost two times more likely to use alternative medicine (Wister et al., 2002).

The complex relationship between health, income and education is far too difficult to reveal using only cursory measures such as average income per year and highest level of education achieved, as this research did. Mechanic (1992) also sees education as an important indicator of good health outcomes and considers socio-economic status to be the best measure to use when examining the relationship between health and income. Specifically, there are three factors that contribute to good health outcomes: schooling, income and occupational status (Mechanic, 1992). Better measures of education than highest level achieved would ask questions about previous occupation, knowledge of current events and world news, as well as interest in support groups and reading materials. Of course, with older adults it is necessary to ask what a person retired from rather than what their current occupation is. It is possible that an older adult who reads periodicals, newspapers, and has Internet access is more likely to be informed about CAM, as well as the testimonials of CAM users. These factors could predispose an older adult to use CAM because they are more informed about the differences between allopathic medicine and CAM.

Outside of demographic predictors, need, or illness factors contribute the most toward explaining the variance in CAM use for each of the three models. Comorbidity is the strongest predictor of CAM for all three groups of CAM: having one or more chronic

illness increases the likelihood of use. This is consistent with the majority of CAM studies that also find support for the relationship between chronic illness and CAM use (Astin et al., 2000; Astin, 1998; Eisenberg et al., 1993, Furnham & Vincent, 2000; Wister et al., 2002). For chiropractic use, need factors contribute the most to the explained variance of the models, whereas only a proportion of the variance was explained by need factors in massage therapy and acupuncture/homeopathy/naturopathy use. What this indicates is that people who use chiropractic do so primarily for reasons directly related to the illness context. These findings were replicated in the longitudinal analysis. Two years later, reporting more levels of pain increases the probability of chiropractic use. One could speculate that chiropractic is meeting a set of needs that are not being met by mainstream medicine. Chiropractic is a manual technique often associated with the treatment of chronic back and joint pain, as well as offering a holistic approach to spinal health care and general well-being. The fact that medical doctors rarely, if at all, attempt to relieve back or joint pain with anything other than pharmaceuticals may be a reason why people with this need seek chiropractic care. Back pain is a strong correlate of loss of productivity and depression, among other things (Leach, 1994) and afflicts a large portion of society. In order to truly test this relationship, however, it is necessary to control for illness *type* and reasons for use.

Perceived health is also a moderate predictor of use for each type of CAM, although not as strong as comorbidity in predicting CAM use. Perceiving your health as poor, compared to excellent decreased the odds of chiropractic use and other types of CAM, but not massage therapy. This was opposite to what the present study expected. It was hypothesized that sickly people would seek out CAM because their need for care was

not being met by mainstream medicine, but this is not the case. Users of chiropractic, acupuncture, homeopathy and naturopathy were more likely to identify with good or excellent health, not poor health, although this relationship was not replicated two years later with acupuncture, homeopathy and naturopathy use. Kelner & Wellman (1998) also found CAM users in their study to be more likely to use CAM if they felt relatively healthy.

An explanation for this could be that perceived health status does not truly measure overall health and may not be an appropriate indicator of care. This is reflected in the literature on CAM studies that finds inconsistencies in perceived health status and its ability to predict CAM use (Astin, 2000). Perhaps this inconsistency stems from the definition of health and the various ways that older adults define it. Strain (1993) found that there is no universal definition for good health, and that increasing age may be associated with a greater tendency to consider function as a measure of good health. Two older adults with similar objective measures of health (i.e., pain and restriction of activity) could vary widely on how they perceive their health. This points to the need to re-define our perception of health from good or poor to a more global measure outside of the illness context. Perhaps perceived health is more of an attitude or belief, rather than a subjective measure of need and should include measures such as quality of life. This type of measure may be more appropriate when examining older adults. Zola (1973) also comments on perceived health status as a variable concept and links it to the need for health services. Basically, Zola (1973) argues that the need for care tends to increase when people perceive a condition as interfering with functional ability. Applying this notion to CAM, one could surmise that if mainstream medicine is not helping an older

adult improve function they could turn to CAM in desperation, whether or not they feel healthy.

The notion that people with poor overall health use CAM is not truly borne out in this study's findings, but it is supported in the literature. Older adults with greater restrictions on function, higher levels of pain and more than one chronic illness were more likely to use all three groups of CAM, regardless of perceived health. These findings lend support to the contention that the 'sickly marshal all available resources' (Foster et al., 2000, pg.1564) when seeking pain relief and symptom control. Astin (2000) attributes the association between poor overall health and increasing CAM use to several possibilities. First, those with poor health are least likely to have had success in treating health-related problems and therefore are more likely to search for alternatives. Second, those who report poor health may be somatizers, a psychiatric term used to describe people who seek out health services when no apparent physiological explanation exists for the symptoms (Barsky & Borus, 1995). Somatizers are a common concern in primary care (Mechanic, 1992). Earlier studies on CAM use found that homeopathic users had higher levels of psychiatric disturbances (i.e., neuroticism scale) than general practitioner patients (Furnham & Smith, 1988). Although this study did not test for neurotic tendencies, or other psychological traits, it would be interesting to test for association between somatizers and CAM users.

Another possibility is that over-users of all health services are using CAM. Some researchers call these people the "worried well" (Taylor, 1985). These people use physicians more and tend to engage in protective behaviours more often than people who are less worried about their health. Older adults considered to be 'worried well' were

shown to use physician services more than older adults who were less worried about their health (Wolinsky & Johnson, 1991). The degree to which a person worries about health might be due, in part to the degree of attention, or inattention paid to pain and symptoms. Patients vary widely in response to symptoms from extreme sensitivity to denial (Mechanic, 1979). The 'worried well' may be more in-tune to their bodies and demonstrate a greater propensity to use health services to deal with bodily changes, even if it means going outside of mainstream medicine in search of the best treatments.

Whether it is the 'worried well', the 'sickly' or the 'somatizers' who are using CAM, or if in fact these terms represent that same group of people, the fact remains that these groups represent a branch of society that is motivated by more than just the physical aspects of health for CAM and a tendency to be heavy users of health services. Isolating the characteristics and behaviourial traits of over-users of health services, including those who demonstrate neurotic tendencies, would make for fruitful research on the reasons people use CAM. Research that uses health-linked data to examine patterns of use could establish a relationship between frequent users of conventional services and CAM. Insight into the rate of dual use of CAM and mainstream medicine could identify whether there are a group of people using all available treatment options to source health problems, real or not. One limitation is that health linked data may not be available for CAM because CAM is not linked to medical services data. Thus, it is necessary to design a study using CAM practitioner's files or rely on patient recall in determining dual rates of use.

Health Beliefs

The health belief measures used to predict CAM use in this study were very weak in both the cross-sectional and longitudinal analyses. The fact that health beliefs contribute very little to explaining health service use is not an uncommon finding. Strain (1990, 1991) found that health beliefs contribute very little in explaining the variation in health service use (less than 3% of explained variance). This rate is slightly higher than the present research's findings. Although Strain (1990, 1991) looked at conventional health services and not CAM, health beliefs appear to be relatively unimportant when it comes to predicting health services in general. Before this research discusses why this might be so, a discussion on the two health beliefs examined in this thesis will ensue.

In the cross-sectional analysis, support was found only for the pull factors of CAM use in 1998/99. In other words, having an alternative ideology could pull people to use CAM. Believing that spirituality is very important and that health care decisions are a personal responsibility increased the odds of CAM use for almost all of the three groups of CAM users. Furnham and Forey (1994), among others (Siapush, 1998) have also found that pull factors are better indicators of CAM use than push factors. Conceivably, postmodern beliefs such as alternative ideologies may be better predictors of CAM use compared to dissatisfaction or skepticism measures.

There are several considerations as to why having an alternative ideology increases the likelihood of CAM use. First, an alternative ideology could be part of a larger belief system that embraces the spiritual and holistic aspects of health. Desire for an approach to health that includes the spirit, mind and body is more likely to be fostered in the CAM practitioner/patient relationship than in mainstream medicine. Research has

shown that the relationship between a CAM practitioner and patient is very different from the formal medical system (Sharma, 2000). CAM practitioners involve the patient more in the decision-making process and offer the patient more alternatives than medical doctors do. The intimate nature of CAM which rests on the practices of touching patients and counseling could entice people to CAM, particularly those people for whom spirituality is important.

Second, an alternative ideology might be part of larger postmodern trend that sees patients moving from a dependent role to a more active partner in health. This trend includes not only the patient/practitioner relationship that fosters partnership, but also includes the health consumer movement evident in society today and emphasized over the last decade. Cassileth's (1998) asserts that CAM users are more selective and see health care as a personal responsibility. Other research recognizes this consumer movement as a strong contributing factor in the increasing use of CAM in North America (Cassileth, 1998; Furnham & Vincent, 2000). CAM users are considered by some to be "smart consumers" who use all available options in seeking health care (Kelner & Wellman, 1997, p.211). These postulations, coupled with the finding that highly educated people use CAM paint a picture of a highly informed consumer seeking optimum health care.

Unmet health care needs (i.e., disenchantment with medicine), deemed a push factor, did not predict CAM use for any of the three groups in 1998/99. This finding replicates an earlier study on CAM use that found disenchantment with medicine does not predict CAM use (Astin, 1998). Instead, patients who use CAM do so because they have a holistic orientation to health, not because they are unhappy with conventional

medicine. Contrary to what was hypothesized, it appears that disenchantment with the formal health care system does not push people to use different types of CAM. This was an unexpected finding, particularly because unmet health care needs were shown to increase between the two time frames. This research expected a relationship between the two trends: increasing unmet health care needs and increasing use of CAM. One interpretation of this could be that disenchantment with medicine is actually a part of an alternative ideology belief system and not separate from it. As identified earlier, an alternative ideology could be more of a social movement that distinguishes CAM users from non-users, rather than a critique of the formal medical system. Partial evidence for this proposition comes from Kelner & Wellman (1997). They found that both push and pull factors predict CAM use and may in fact be measuring the same beliefs. In fact, Furnham and Vincent (2000) also acknowledge that disenchantment with medicine and an alternative ideology are similar constructs and may be belief systems associated with CAM users in general.

Theoretical Framework

This research attempted to build a theoretical model on CAM use. Research tends to examine the differences between CAM users and non-users, rather than how CAM users differ from each other. This research took a conceptual approach to describe the difference between CAM and allopathic medicine based on the context in which CAM is delivered. The context of CAM and its delivery is centered on the professional differences between allopathic medicine and various types of CAM including: (a) the diagnostic and education practices associated with each, (b) the licensing and regulation

practices outlined by each profession and, finally, (c) the scope of practice for each CAM.

The primary contention of this research was that as CAM users move further from mainstream medicine the more likely they are to associate with an alternative ideology and disenchantment with medicine. Although the results from this thesis did not fully support this contention, there was support for the fact that CAM users differ from each other. These findings parallel Furnham's (1997) contention that different CAM therapies attract distinct clienteles. For example, a person who uses chiropractic for back problems is likely to be different from someone who uses an acupuncturist for depression.

Health beliefs of CAM users were expected to differ from each other depending on the proximity of the type of CAM to mainstream medicine. This association was not stronger for CAMs deemed further from mainstream medicine, as hypothesized, although partial support was found. Acupuncture, homeopathy and naturopathy, deemed the furthest from mainstream medicine, did have the strongest relationship with spirituality and personal responsibility for health explaining 2.4% of the variance; two times that of the explained variance for both chiropractic and acupuncture/homeopathy/naturopathy use. This was a finding in the expected direction. Having an alternative ideology predicted chiropractic use, but not massage therapy. This was an unexpected finding. Chiropractic was expected to be closer to mainstream medicine than massage therapy, mostly due to chiropractic's strict regulation and licensure and educational compatibility with conventional medicine. What this suggests is that massage therapy may be

conceptually closer to mainstream medicine than chiropractic and that users of massage therapy will be less likely to share similar beliefs with users of more alternative therapies.

The longitudinal findings support this suggestion. Two years later, chiropractic and acupuncture/homeopathy/naturopathy users continue to demonstrate significant associations with spirituality and having a personal responsibility for health also continues to predict acupuncture, homeopathy, naturopathy. Thus, support for the hypothesis that an alternative ideology is more representative of alternative users, such as acupuncture, homeopathy and naturopathy compared to chiropractic and massage therapy is found and therefore is consistent with the conceptual continuum put forth in this thesis. The unexpected discovery that massage therapy use is only weakly associated with health beliefs in the cross sectional analysis, and not at all associated in the longitudinal analysis lends support for the belief that massage therapy is conceptually closer to mainstream medicine than chiropractic. Thus, it is necessary to revise the original continuum of CAM outlined in this thesis and place massage therapy closer to mainstream medicine, and chiropractic to fall in the middle of the continuum. Due to the fact that there is no literature that looks at the variation between CAM users and explains the variation as a function of the proximity of CAM to mainstream medicine, one can only speculate with caution on the health belief findings from this present research. Furthermore, these findings are very weak, despite the contribution of the large sample size to the power of this study in predicting CAM use.

A combination of the SBM and the HBM proved useful in predicting CAM use for older adults and as a framework for outlining the many predictors of CAM. For all three types of CAM, need is a consistent predictor of use when the necessary

predisposing and enabling factors are accounted for (de Boer et al., 1997; Mechanic, 1979; Wellman & Kelner, 1997). Surprisingly, the majority of explained variance is predicted by predisposing characteristics in massage therapy and acupuncture/homeopathy/naturopathy use. Strain (1991) also found that factors other than need do contribute to the overall explained variance when examining health beliefs, older adults and physician use, but these factors did not contribute as much as the need factors. Overall, however, most health service research finds need to explain most of the variation in use (Mechanic, 1979). Despite the attempts of this thesis to isolate health beliefs and to consider them to be outside of predisposing or enabling characteristics, as most multivariate health research does, health beliefs are still undetected. One could speculate that health beliefs are extremely complex constructs and not easily measured using broad measures of beliefs outlined in a health survey, or measured on scales.

Limitations

The variable nature of the predictors of CAM examined in this study made it difficult to determine any clear patterns or trends of use for older adults. This points to the need for a new approach to researching health services. Current utilization models continue to contribute very little to the understanding of how people vary in their use of health services, even when elements from other utilization models are combined. This thesis combined both the HBM and the SBM to explain the push/pull factors and general predictors of use in an effort to address the theoretical aspects of CAM use. However, the basic problem with these theoretical approaches is that the emphasis is on the outcome, specifically a dichotomy of "yes/no" responses. Pescosolido (2000; p.189)

calls this the "tyranny of use/no use". The either-or conceptualization of CAM use places a person's entire history of use into one response. Ideally, analyzing CAM use with open-ended questions, or constructs that measure commitment to CAM rather than use or non-use could explain use better than asking whether or not a person uses CAM (Balneaves, Kristjanson & Tataryn, 1999). Furthermore, the discrete measure of CAM examined in this thesis (i.e., in the last twelve months have you visited an alternative practitioner?), could be overlooking older adults who consider his or her CAM practitioner to be a primary practitioner and not an 'alternative' practitioner. As mentioned earlier, the problems with defining and describing CAM can influence how questions are asked and answered. Consequently, the frequency of CAM use found in this sample could be underestimating the true use of CAM for older adults.

Perhaps the lack of association found between disenchantment with medicine and CAM use in this study can be attributed to measurement issues. The measure of unmet health care needs used may have been too broad because it encompasses all health care needs, including practical and ideological needs. Transportation, language and waiting times are examples of health care needs and they are grouped with other needs such as opinion of doctors, and a feeling that medical care is inadequate. This broad measure may be detecting perceived health care needs that include traditional measures of access to health care use. Older adults' and access to health care, including transportation and waiting times are identified areas of problems with access to health services (Wolinsky & Johnson, 1991). In fact, transportation, language and waiting times may be access issues for CAM users also (Kelner & Wellman, 1997). Essentially, the measure of disenchantment with medicine used in this study may have been addressing the *structure*

of both CAM and allopathic systems and not the ideological limitations of allopathic medicine. Furthermore, some respondents may have been replying to this question with CAM in mind and thinking of unmet health care needs within CAM and not the allopathic model, which is what this research was trying to measure.

The measure used for spirituality was also a very broad measure. Spirituality and faith are grouped together in the NPHS and may actually be different concepts. Respondents could be responding to this question with religion in mind and there are distinct differences between the two. Spirituality encompasses a broader meaning than religion and can exist outside of a traditional religious system. Religion can be considered the expression of spiritual well being and the framework from which spirituality is expressed. Thus, the finding that spirituality was associated with CAM use could reflect characteristics of older adults and their use of religion. Many older adults consider religion and spirituality to be important elements in life (Hicks, 1999). This is reflected in the finding that almost 75% of this sample identified with the importance of spirituality and faith in life.

In order to truly get at health beliefs, such as spirituality, it is essential to ask questions about how important the spirit is in treating health-related matters. In the early century, with the development of science and medicine, the mind and body were viewed as separate entities, and the body viewed as a machine with pieces that can be replaced and repaired. Over the last several decades, a resurgence of spirituality and holistic health has fueled enormous interest in the power of the mind to heal. This interest has led to double-blind studies (the "gold-seal" standard of efficacy studies), as well as numerous books and Internet sites on the topic. Without having efficacy studies on CAM use, it

would be difficult to examine the cause or effect of CAM and spirituality. Establishing better measures of health beliefs and by including measures of prayer and meditation, some light could be shed on this intricate and mysterious area of CAM and health.

How the CAM user interprets the connection between the mind, body and spirit would bring richness and depth to the examination of health beliefs and CAM use. The relationship between health and spirituality dates to Plato and beyond. Aging is believed to increase the importance of spirituality and health. Plato eloquently states 'as physical eyesight declines, the spiritual eyesight increases' (n.d). Spirituality has been identified as an essential component of an older adult's experience of *feeling* healthy (Hicks, 1999). Ways to measure the interaction between spirituality and health, particularly as they relate to function and well-being among older adults could improve the ability to detect stronger relationships in health beliefs and health service research. It would be very interesting to apply these measures to the examination of why spirituality as a predictor of chiropractic use increased over the two years.

Important measures of need, such as the duration and severity of illness, could also help capture whether it is long-time sufferers who seek out CAM or not. Unfortunately, the NPHS does not ask questions about duration or severity of illness. An indicator of duration and severity could provide insight into whether people are pushed or pulled into CAM use, and how far into the illness CAM was used. Essentially, it is impossible to know whether this thesis looked at people who had been using CAM for many years, or new users. The only way to determine whether it is push or pull factors, or both, is to use pathway studies that control for the duration a person has had a chronic illness and how long they have been using CAM.

Greater insight into why unmet health care needs did not predict CAM use could be found by looking beyond access issues, such as income, transportation and waiting times, and focusing on patient's attitudes toward their doctors and satisfaction with the health care encounter. Using patient satisfaction as an outcome for conventional or complementary medicine use could indicate which type of care is meeting patient needs. Detailed questions that look at communication and compliance of the patient/doctor encounter might reveal whether it is the deliverer of the care, or the basic philosophy of the formal health care model that is not meeting patients' needs and expectations. The lack of communication between general practitioners and CAM users has been indicated in several population studies (Eisenberg et al., 1993). Using patient satisfaction as a measure of how a CAM user views allopathic medicine, combined with information on other health indicators, could lead to a better understanding about whether mainstream and CAM models are complementing or supplementing each other.

Despite using longitudinal panel data to reduce the amount of variation between the independent and dependent variables, only a modest amount of variation of use was explained in the longitudinal analysis. Most of this can be attributed to the lack of the utilization models used to model and predict the true nature of health behaviour (Mechanic, 1999). Another explanation could be that the measures used to look at health beliefs were not asked in every survey cycle. The structure of the NPHS questionnaire with its changing content from year to year made it difficult to track health beliefs over time. Spirituality was only measured in the 1996/97 questionnaire and questions about personal responsibility for health were only asked in 1998/99. This limited the analyses to two time periods from the available four time periods. By examining CAM use over

longer periods of time, this thesis might have found stronger associations for health beliefs in predicting CAM use. Furthermore, lag effects (like the statistical significance of spirituality in predicting chiropractic use in the longitudinal analysis but not the cross-sectional analysis) are illuminated when measuring variables over longer periods of time.

Due to the sampling frame of the NPHS, only adults living in households are included and older adults living on native reserves and in institutional settings were not included. This restriction could limit the generalizability of these findings. Older adults living in institutions are likely to be of poor health with a high incidence of chronic illness. As noted in this thesis and in the literature, a strong correlate of CAM use is chronic illness and pain, thus one could speculate that these older adults would be CAM users. On the other hand, the likelihood is quite high that these older adults living in institutions are frail. In the current context of health care in British Columbia, placement into institutions results when the level of care needs exceeds the resources available to provide care in the home. In which case, older adults living in institutions are likely to be frail and not able to access CAM services. The exclusion of native older adults, or elders, from this sample is unfortunate because elders are likely to use folk medicine or home remedies and rely less on mainstream medicine (Sharma, 1992). Conversely, this thesis looked only at formal CAM services and not informal services so the frequency of use of folk medicine, and the belief systems of these users would not have contributed to the present findings. Overall, and notwithstanding these limitations, this research contributes population panel data to virgin territory in gerontology and health science research and provides insight into the 'who, what and why' of older adults' use of CAM.

Future Directions & Conclusions

Outside of the future directions discussed earlier in this chapter, (a) examining somatizers, 'the worried well', 'smart consumers' and frequency of CAM use; (b) re-defining health measures in search of a global measure for health; (c) selecting more appropriate health outcomes specific to alternative medicine; further investigation into distinguishing between first time CAM users and longer, habitual users is warranted. In order to do this, moving beyond the yes/no category of use is important. Qualitative research that examines the reasons why people use CAM, and the themes arising from this type of research could be used to describe health beliefs specific to CAM use.

An effective way of looking at CAM use along a trajectory is to examine pathways to care. Medical history and the career of CAM users is a seriously under-researched area (Furnham & Vincent, 2000). Using pathway analysis helps pinpoint where in the illness trajectory the person seeks CAM. Gray (1985) found that arthritis sufferers with longer periods since onset were more likely to utilize a range of treatments that include conventional, alternative and self-care treatments than those with shorter periods since onset. Other pathway studies of health service use, also find that length of illness has a positive association with an increase in the diversity of options being exercised (Strain, 1989; Wellman, 1995). If a person with poor health turns to CAM after heavy use of the conventional system with no relief, how do they differ from a person with similar illness characteristics who is happy with conventional medicine and uses CAM because it is more holistic? Both people are similar, and both people use CAM, yet how they enter the CAM model is likely to be different: one might be pushed to use CAM and the other is pulled. Examining pathways to care could help identify if

habitual CAM users are heavy users of all types of health services, or if they are dissatisfied with the formal system, use it sparingly and, instead, use CAM as primary health care because it is more compatible with their belief systems.

Another important area for future research is an examination of culture, ethnicity and CAM use. Certainly many types of CAM are rooted in cultural contexts outside of North America and western culture. For instance, acupuncture or Traditional Chinese Medicine (TCM) is founded by and used by people of Asian descent and may not be considered 'alternative' medicine by them. Instead, the allopathic model of care and treatment (e.g., pharmaceuticals) may seem foreign and secondary. These types of cultural influences can influence the rates of CAM use when looking at older adults and the way that people respond in health surveys. For instance, a person who use TCM but do not feel it is 'alternative' due to their ethnic and cultural identity may state *no* they did not visit a CAM practitioner in the last year when in fact they did. It is difficult to know how this impacted the present studies findings and the rates of CAM use for older Canadians because this study did not examine socio-cultural factors. Another important area for future research would examine folk medicine and informal CAM practices for older adults. Although not the focus of this research, it is recognized that many older adults use informal types of CAM. Herbals are a popular form of treating treat chronic illness (e.g., ginko biloba for dementia and CoEnzyme Q10 for arthritis). The relationship between informal CAM and health beliefs outside of formal services may also support the finding that an alternative ideology is associated with CAM use.

This study contributes to the understanding of the physical need for care and sheds light on how older adults use different types of CAM. Due to the large number of

adults with chronic illness and the movement towards personal responsibility for health, knowledge about CAM users is essential. For example, knowing that chronic illness is a strong predictor of CAM use, a health care practitioner can be better informed on whether an older adult with chronic illness is using both the formal and CAM systems for the same problem. This type of information is important because not all CAM offers federally approved and efficacious treatments. Also, the lack of patient communication with medical doctors about CAM use could pose serious health risks. The risks involved in simultaneously using herbals, homeopathic remedies and pharmaceuticals are a concern simply because there is not enough information about the consequences of combining these treatments.

The results of this study are meaningful for several reasons. Although this research was not able to clearly isolate health beliefs as push or pull predictors of CAM, this research was able to show that health beliefs are associated with CAM use and can change with time. An even greater contribution of this study to CAM research is that CAM users are not a homogenous group. The observation that older females were more likely than older males to use massage therapy is one example of the many important findings presented here. Prior to this research, it was believed that most people who use CAM were similar in nature. This is not the case. This research shows that as a CAM user moves further from mainstream or formal health care, the more likely they are to report philosophical congruence with CAM, and identify with different demographics and health status patterns.

In light of population aging, and the propensity for baby boomer adults to seek new holistic and spiritual forms of health care, one can expect an increase in the number

of older adults using CAM in the near future. The diversity of CAM being used will also increase, as we see the supply of alternative practitioners continue to grow and changes to the professionalization of health care take place. It is quite likely that the number of integrated health care centers will also increase to meet the demand for integrated and holistic health care. Changes to the Health Professions Act over the last five years indicate that this is the direction being taken by the British Columbia government. Health professions are moving toward a non-exclusive scope of practice that allows for movement between professions. Granted this movement is restricted in that not all professions can perform all acts, yet the legislation is designed to allow for greater movement between professions.

The information society in which we live enables people to be informed about health and illness, and to be aware of the limitations of various approaches to health in treating chronic illness and addressing the emotional and spiritual needs of some patients. A move towards an integrated approach to health care and the sharing of information between arenas will help practitioners and health care consumers make informed and safe choices about health. More educated people have the ability to critique conventional systems of health and CAM. This ability enables movement outside of mainstream medicine in search of treatment that fits that person's need. Essentially, the informed consumer is shaping health care. The fact that the largest age group driving CAM use for older adults is expected to grow even larger over the next two decades points towards an increase frequency of use. Driven by greater information about CAM and how to access it, the ability to critique conventional medicine and be informed about health and illness, we see an informed consumer shaping health care today and for the future.

Appendix A. National Population Health Survey Questionnaires

1996/97: http://www.statcan.ca/english/concepts/nphs/quest96e.pdf

1998/99: http://www.statcan.ca/english/concepts/nphs/quest98e.pdf

2000/01: http://www.statcan.ca/english/concepts/nphs/quest00e.pdf

Appendix B. Missing Data for All Variables in 1998/99.

Dependent Variables:	
Chiropractic Use in 1998/99	Not stated=21 Don't know=3
Acupuncture/ Homeopathy/ Naturopathy Use in 1998/99	Not stated=22 Don't know=0
Massage Use in 1998/99	Not Stated=21 Don't know=1
Independent Variables:	
Self-Perceived Health	Refused=1 Don't know=3
Chronic Illness	Not Stated=26
Pain & Function	Don't know=12
Unmet health care Needs	Don't know=1
Spiritual Importance in life	Don't know=8 Refused=4 Not stated=100
Total Household Income	Not stated=270

Appendix C: Questions for Personal Responsibility for Health Belief.[8]

1. I prefer doctors who give me choices or options and let me decide for myself what to do.
    a. Strongly Agree
    b. Agree
    c. Neither agree nor disagree
    d. Disagree
    e. Strongly Disagree

2. Patients should never challenge the authority of the doctor.
    a. Strongly Agree
    b. Agree
    c. Neither agree nor disagree
    d. Disagree
    e. Strongly Disagree
3. I prefer that the doctor assume all of the responsibility for my medical care.
    a. Strongly Agree
    b. Agree
    c. Neither agree nor disagree
    d. Disagree
    e. Strongly Disagree
4. Except for serious illness, it is generally better to take care of your own health than go to a doctor.
    a. Strongly Agree
    b. Agree
    c. Neither agree nor disagree
    d. Disagree
    e. Strongly Disagree
5. It is almost always better to go to a doctor than to try to treat yourself.
    a. Strongly Agree
    b. Agree
    c. Neither agree nor disagree
    d. Disagree
    e. Strongly Disagree

[8] Statistics Canada. National Population Health Survey Questionnaire.1998: Longitudinal File. P.33

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