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The purpose of this study was to determine the demographic profiles, the major reported health problems, and the complementary, alternative (CAM), and conventional treatments used for these health problems and for wellness by a sample of rural Appalachian chiropractic patients. Differences in patient profiles among patients with acute and chronic problems and between chiropractic and non-chiropractic problems were also analyzed.

A non-experimental descriptive cross-sectional design was employed. Descriptive analyses revealed that participants (N = 130) were 37 men and 93 women who were predominately white, married, middle-aged, well-educated and lived in Lee, Wise, Floyd or a surrounding county in Southwest Virginia. The majority of respondents were employed, insured, had an income greater than $35,000 per year, and reported their health as either "very good" or "good." They reported a low rate of alcohol and tobacco use. They tended to use either a Doctor of Chiropractic (DC) or a medical provider or both as a regular source of health care. A DC was used as a health care provider six percent more than a medical provider for regular health care visits.

Respondents reported forty separate health conditions as the main two health problems they experienced, the majority being chronic versus acute problems. Back, neck, and joint problems were the most frequently reported followed by headaches, diabetes, hypertension, thyroid, gastrointestinal, sinus and lung problems. The majority of the sample used chiropractic manipulation/adjustment with a substantial percentage of

respondents using massage therapy or the two treatments concurrently. Chiropractic manipulation was used by one-quarter to one-third of those with diabetes and hypertension to treat these conditions and was employed by respondents with thyroid, gastrointestinal, sinus and lung problems as well. About one-quarter to one-half of respondents with these conditions used chiropractic manipulation, massage therapy, or both therapies together for treatment. The use of energy work, counseling, physical therapy, and reflexology were reported by only a small number of respondents.

Differences in patient profiles among patients with acute and chronic health problems were evaluated with those with acute health problems perceiving better health status as compared with those with chronic health conditions. Those respondents who were not working were found to have non-chiropractic or medical problems more often.

CHIROPRACTIC AND CONVENTIONAL THERAPY FOR ACUTE AND CHRONIC HEALTH CONDITIONS AMONG APPLACHIAN RESIDENTS

by

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APPROVAL PAGE

This dissertation written by VIRGINIA K. WEISZ has been approved by the following committee of the Faculty of The Graduate School at the University of North Carolina at Greensboro.

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CHAPTER I

INTRODUCTION

Rural Appalachian residents have been found to experience significant health challenges including more chronic illness, hospitalization and mortality when compared with non-Appalachian groups (Behringer & Freidell, 2006; Halverson, Ma, & Harner, 2004; Huttlinger, Schaller-Ayers, & Lawson, 2004; McGarvey, Leon-Verdin, Killos, Guterbock & Cohn, 2011). Southwest Virginia is a rural Appalachian region with high rates of musculoskeletal complaints, including joint and back conditions, as well as hypertension, obesity, depression (Huttlinger et al., 2004) and cancer (McGarvey et al., 2011). Those who live in mountain mining areas, such as Wise and Lee Counties in Southwest Virginia have been found to have poorer mental and physical health as compared with those living in four other Central Appalachian states in coal mining and non-mining areas (Zullig & Hendryx, 2011). These health disparities are compounded by the fact that Appalachian rural residents tend to be older, have lower incomes and lower rates of insurance compared with other Americans (Behringer & Freidell, 2006; Haaga, 2004; Huttlinger et al., 2004).

Other factors affecting health care for rural Appalachian populations are reduced health access due to the low number of practicing primary-care providers (National Rural Health Association [NRHA], 2011; Ricketts, 2000), few specialists (United Health Center for Health Reform & Modernization [UHCHRM], 2011) and very limited mental

health services (Institute of Medicine of the National Academies[IOM], 2005). Significant transportation barriers also have been reported. These include little or no public transportation to health care facilities (Kemp, 2008), the lack of a personal vehicle (Barish & Snyder, 2008) and long distances to health care facilities (Arcury, Preisser, Gesler, & Powers, 2005; Barish & Snyder, 2008; Butler, 2006; Huttlinger, et al., 2004; IOM, 2005; Kemp, 2008; NRHA, 2011; UHCHRM, 2011).

Rural Appalachian residents have a longstanding tradition of using complementary and alternative medicine (CAM) (Barish & Snyder, 2008). These residents visit Doctors of Chiropractic (DCs) more often than any other CAM practitioners (Arcury, Bell, Vitolins, & Quandt, 2005; Arcury, Preisser, Gesler, & Sherman, 2004). Additionally, higher rates of chiropractic care have been noted in health professional shortage areas (HPSAs), such as those in Southwest Virginia (Hawk & Long, 1999; Lind, Diehr, Grembowski & Lafferty, 2009; Ricketts, 2000; Smith & Carber, 2002). DCs are seen by rural Appalachian patients for both musculoskeletal and non-musculoskeletal complaints (Smith & Carber, 2002). Information about patterns of health care use including CAM among rural Appalachian residents is limited (Arcury, Bell, et al., 2005; Arcury, Preisser et al., 2005; Barish & Snyder, 2008).

Purpose of Study

The purpose of this study was to determine the demographic profiles, the major reported health problems and which complementary and alternative (CAM) and conventional treatments a sample of rural southwest Virginia chiropractic patients use for these health problems and for wellness. Difference in patient profiles among patients with

acute and chronic problems and those with traditionally chiropractic versus non-chiropractic problems was also determined. Patient profiles were developed using a set of demographic variables representing predisposing, enabling and perceived need characteristics within the context of the Aday and Andersen model (Aday & Andersen, 1974; Andersen, 1995).

Study participants were rural residents of three Appalachian counties in Southwest Virginia: Floyd, Lee and Wise. These counties were chosen because they have been designated as Health Professional Shortage Areas (HPSAs); (Health Resources & Service Administration [HRSAa] (2011), as well as Medically Underserved Areas (MUAs) (HRSAb, 2011). Sociodemographic variables in the Andersen Behavioral Model (Aday & Andersen, 1974; Andersen, 1995) were used to evaluate the use of CAM and conventional CAM treatment from a health service utilization perspective. Demographic characteristics were separated into predisposing, enabling and need characteristics. Predisposing factors in this study included individual characteristics of rural residents that described their propensity to use CAM and/or conventional healthcare services. Enabling factors in this study were the means available or barriers for use of CAM and/or conventional services. Need factors addressed the illness or the reason for use of CAM and/ or conventional services.

The findings of this study will give health care providers and policy-makers information regarding the health challenges experienced by rural Southwest Virginia residents and the CAM and conventional healthcare practices used by those seeking healthcare at rural chiropractic offices. It is hoped that this information will help policy-

makers and providers improve health care services for residents in rural Appalachian areas by developing services that meet their specific needs.

A non-experimental descriptive cross-sectional design had the following overall aims:

1) To determine the demographic profile of study participants.
2) To determine the major health problems reported by study participants.
3) To determine what CAM and conventional therapies chiropractic patients have tried to treat health problems.
4) To determine the differences in patient profiles among patients with acute and chronic problems.
5) To determine the differences in patient profiles among patients with chiropractic or non-chiropractic health problems.

The major research questions of this study were the following:

1) What are the demographic characteristics of study participants who reside in rural southwest Virginia?
2) What are the major health problems for which study participants see a provider of chiropractic care?
3) What complementary and alternative medicine (CAM) and conventional therapies have chiropractic patients tried to treat health problems?
4) Are there differences in patient profiles among patients with acute and chronic health problems seen at rural chiropractic practices?

5) Are there differences in patient profiles between patients with chiropractic, and non-chiropractic health problems seen at rural chiropractic practices?

Background and Significance

Characteristics of Rural Populations in the U.S.

Rural populations face obstacles and disparities not experienced by those in urban settings. Rural populations have more elders and children, lower education levels and lower population density with more poor, unemployed and underemployed residents (NRHA, 2011; UHCHRM, 2011). In addition to being more likely to live below the poverty level (Ricketts, 2000; UHCHRM, 2011), rural residents are less likely to have insurance coverage (Hillmeier, Weisman, Chase & Dyer, 2008), including employer-related insurance coverage and prescription benefits (Butler, 2006; Hillmeier et al., 2008). Rural, as opposed to urban residents have a higher prevalence of chronic disease, including chronic pain (Hoffman, Meier, & Council, 2002), hypertension and heart disease (Arcury, Grzywacz, Neiberg, Nguyen, et al., 2011) and describe their health as fair or poor (Ricketts, 2000; UHCHRM, 2011, Zullig & Hendryx, 2011). High levels of musculoskeletal problems in rural residents include arthritis (Arcury, Grzywacz, Neiberg, Nguyen, et al., 2011; Huttlinger et al., 2004), back pain and other musculoskeletal pain (Del Mundo, Sheperd & Marose, 2002; Hoffman et al., 2002; Huttlinger et al., 2004; Lipscomb, Dement, Epling, McDonald, & Schoenfisch, 2007; Vallerand, Fouladbakhsh & Templin, 2004). This corresponds with frequent visits to DCs in rural areas (Hawk & Long, 1999; Lind, et al., 2009; Ricketts, 2000; Smith & Carber, 2002). A higher prevalence of depressive illness (Probst, et al., 2006; Tudiver, Edwards, & Pfortmiller,

2010), as well as multiple stressors such as poverty, lack of social support, and health conditions such as diabetes and obesity contributing to mental health problems have been found in rural residents (Hillmeier, et al., 2008). Rural residents also experience higher mortality rates including death by suicide (Hart, Larson, & Lishner, 2005; Murray et al., 2006, NRHA, 2011). Poor health practices, including smoking (Zullig & Hendryx, 2011) and lower rates of exercise with related higher rates of obesity have been documented in rural versus urban areas (IOM, 2005; UHCHRM, 2011).

Rural access to health care. Rural populations have less access to a regular primary-care provider (PCP) (Ricketts, 2000). Health care access is limited by the fact that although one fourth of Americans live in rural areas, only one-tenth of physicians practice in these areas (NRHA, 2011). More generalists and fewer specialists practice in rural areas (UHCHRM, 2011). Services offered by rural health care facilities are more limited and hospitals have high rates of closure (Hart et al., 2005). The UHCHRM (2011) reported that in remote rural areas there were fewer than half the primary care physicians available for care as compared with urban areas. Chan, Hart and Goodman (2005) found that rural Medicare beneficiaries had almost 10% fewer health care visits overall and 10% fewer visits to medical specialists when compared with urban recipients.

Laditka, Laditka and Probst (2009) studied levels of rurality associated with hospitalizations for conditions in eight states including North Carolina, South Carolina and Kentucky that could have been treated in an outpatient setting (ambulatory care-sensitive conditions [ACSCs]). The mean rates of hospitalizations for ACSCs have been notably higher in rural as opposed to urban areas. Rural hospitalization rates in the study

were found to be over 90% greater than those for urban areas. The authors interpreted this finding to mean that effectiveness and accessibility of primary care decreases with increasing rurality. Because of limited mental health screening opportunities, there is a resultant documented undetected morbidity of these types of problems for residents living in rural areas(Tudiver et al., 2010). Mental health services are also chronically limited in rural areas, mainly due to a deficiency of qualified mental health providers (IOM, 2005). However, rural residents overall, as well as those with chronic conditions such as low back pain, have been shown to benefit greatly from counseling modalities such as cognitive behavioral therapy (Pincus et al., 2002; Scogin, et al., 2007).

Transportation has been found to be a barrier to accessing health care for rural residents who often need to drive long distances to see health care providers (Arcury, Preisser, et al., 2005; Barish and Snyder, 2008, Butler, 2006; Chan, et al., 2005; Huttlinger, et al., 2004; IOM, 2005; Kemp, 2008, NRHA, 2011; UHCHRM, 2011). Barish and Snyder (2008) reported that transportation barriers existed to accessing healthcare for rural Southwest Virginia residents who attended a health clinic. This included the finding that nearly one third of these residents did not own a vehicle. Kemp (2008) reported concerns of residents that hospital access was difficult due to a significant distance to travel, and that there was no public transportation within Floyd County, one of the counties in the current study. Smith and Carber (2002) evaluated visits to DCs stratified by rural-urban locations and found that those who practiced in rural HPSA designated areas accepted fewer walk-in patients which limited health care access for the rural residents. For those who did accept walk-ins, the patients had longer

wait times. The authors also found that rural chiropractic patients had more difficulty getting physician appointments.

Rural health disparities in Appalachia. Rural health disparities, described as resulting from "differences in the incidence, prevalence, mortality, and burden of diseases and other adverse health conditions" (Halverson, et al., 2004, p. ii), are notable in the Appalachian region including Southwest Virginia (Behringer & Freidell, 2006; Huttlinger, et al., 2004; McGarvey, et al., 2010). Residents of rural Appalachia are known to be generally older than the rest of the United States population due to out-migration of young adults from this area (Haaga, 2004). They are more likely to report lower incomes, less likely to be insured and are also more likely to engage in high risk behaviors such as tobacco use when compared with other Americans (Behringer & Freidell, 2006). The population of rural Appalachia has suffered from a disproportionate amount of hospitalization and mortality as compared to non-Appalachian groups (Halverson et al., 2004). Residents of Appalachia over the age of 35 die younger from chronic diseases such as cancer and heart disease, with the highest rates noted in Central and Southern Appalachia (Behringer, & Freidell, 2006; Halverson et al., 2004).

A higher prevalence of mental health disorders, notably psychological stress and depressive illness, has been documented in Central Appalachia, including Southwest Virginia (Zhang, Infante, et al., 2008; Zullig & Hendryx, 2011. Huttlinger et al. (2004) found that musculoskeletal problems such as arthritis and back problems, as well as hypertension, obesity, tooth problems and depression were the most prevalent chronic disease conditions in a sample of Southwest Virginians. Arcury, Grzywacz, Neiberg,

Nguyen, et al., (2011) found that older Appalachian residents reported high rates of arthritis, hypertension and heart disease and found that respondents tended to use prescription and over-the-counter medicines, prayer and home remedies for symptoms such as joint pain. Rural Virginians are more likely to have poorer health and to reside in high poverty census tracts than do non-rural Virginia residents (Virginia Department of Health, 2008). Huttlinger et al. (2004) reported that residents in rural Southwest Virginia residents were more likely to be poor and obese and to have more medical conditions as compared with urban Virginia residents. McGarvey et al. (2010) found that residents in the Appalachian counties of Virginia had higher rates of chronic disease and worse perception of their health as compared with those in Virginia's non-Appalachian counties. Other unique challenges for residents in the distressed counties of far Southwest Virginia include unsafe drinking water (Thompson & Litton, 1998) and environmental degradation (Behringer, & Freidell, 2006), which have an adverse effect on the health of these residents. Residents of rural Appalachian mountain coal-mining areas, such as those of Lee and Wise Counties, have been reported to be less likely to be married, less well educated, more likely to be obese, and to have poorer health and health related quality of life as compared with residents of other counties. Rural Appalachian residents are also more likely to be current smokers and to have used alcohol in the last 30 days (Arcury, Preisser, et al., 2004; Barish and Snyder, 2008; Huttlinger et al., 2004). Zullig and Hendryx (2011) found that residents who lived in mountaintop mining areas such as Wise and Lee Counties had more days of poor mental and physical health, limited

activity and lower overall quality of health as compared with counties both inside and outside of Appalachia.

Use of Complementary and Alternative Medicine

The use of complementary and alternative medicine (CAM) by the public has steadily increased in the last few years (Barnes, Powell-Griner, McFann, & Nahin, 2004; Barnes, Bloom, & Nahin, 2008; Nahin, Barnes, Stussman, & Bloom, 2009). The National Center for Complementary and Alternative medicine ([NCCAM], 2011) has divided CAM into four categories: natural products, such as herbal medicine and dietary supplements; mind-body medicine such as meditation, yoga and acupuncture; manipulative and body-based practices, such as massage therapy and chiropractic manipulation; and other CAM practices such as movement therapies, energy therapies and the use of traditional healers. Complementary health practices, which are used by about 40% of the U.S. population (Barnes et al., 2008) are defined as those used in conjunction with conventional medicine. For example, one might use chiropractic care along with conventional care, such as counseling or physical therapy. Alternative practices, which are used by about 19% of the U. S. population (Nahin, Dahlhamer, & Stussman, 2010), are defined as the sole use of CAM without any conventional treatment (Barish, & Snyder, 2008; Barrett et al., 2003; Fouladbakhsh, & Stommel, 2007; Kannan, Gaydos, Atherly & Druss, 2010; Nahin, et al., 2010). The 2007 National Health Interview Survey ([NHIS] Barnes et al., 2008) evaluated the use of CAM in a nationally representative sample. NHIS respondents used CAM most often to treat acute and chronic musculoskeletal problems including neck and back pain, joint conditions and

arthritis (Barnes et al., 2004; Bausell, Lee & Berman, 2001; Cheung, Wyman & Halcon, 2007; Lawrence & Meeker, 2007; Wolsko, Eisenberg, Davis, Ettner, & Phillips, 2002). Other conditions treated by CAM included anxiety, depression, colds and migraines (Barnes et al., 2004; Lawrence & Meeker, 2007; Wolsko, et al., 2002, Wu et al., 2007). Interestingly, the level of this use was unchanged from the NHIS 2002 survey (Barnes et al., 2008). Patients with mental disorders including anxiety and depression have also been found to use CAM more frequently than do patients without these disorders (Bausell et al., 2001; Kessler et al., 2001; Unutzer et al., 2000). When patient satisfaction with CAM is studied, it has been found to be high (Cheung et al., 2007). Rhee, Garg, and Hershey (2004) found that patients attending internal medicine clinics tended to be more frequent users of CAM compared with non-users if they had seen the provider for back or neck problems or for wellness. Del Mundo et al. (2002) found that rural primary care patients used CAM most often for back pain or stress/anxiety with 28% reporting musculoskeletal pain. Seventeen percent of the sample used chiropractic therapy, which was the most common CAM method used.

Chiropractic care. Chiropractic care, including manipulation, has been one of the CAM therapies most commonly used by American adults as indicated in the 2007 NHIS (Barnes et al., 2008). Overall in the U.S., the numbers of adults seeking chiropractic care are increasing. Visits to DCs among U.S. adults increased 57 percent, from 7.7 million in 2000 to 12.1 million in 2003 (Davis, Sirovich & Weeks, 2010). Rates of chiropractic utilization have been reported as 5.6% of the U. S. population from 1997 to 2006 (Davis, et al., 2010), 7.5% in 2007 (Barnes et al., 2008) and 6 to 12% from 1991

to 2004 (Lawrence & Meeker, 2007). Chiropractic visits account for approximately two thirds of outpatient back pain visits (Coulter & Shekelle, 2005). Satisfaction with chiropractic care has generally been reported to be very high (Biondi, 2004; Carey et al., 1995; Chou and Huffman, 2007; Fleming et al. 2007; Hertzman-Miller et al., 2002; Hsieh, et al. 2002; Secor, Blumberg, Markow, MacKenzie, & Thrall, 2004) especially for musculoskeletal conditions such as back, neck and joint pain and also for some non-musculoskeletal conditions including asthma, infantile colic and cervicogenic vertigo (Hawk, Khorsan, Ferrance, & Evans, 2007).

Use of Doctors of Chiropractic by rural residents. Many rural residents use DCs when other health care providers are scarce. Some patients use DCs as their primary care provider (Cambron, Cramer & Winterstein, 2007; Cooper & McKee, 2003; Leach, 2010). Rates of chiropractic care have been found to be higher in rural and HPSAs (Hawk & Long, 1999; Lind, et al., 2009; Ricketts, 2000; Smith & Carber, 2002). Arcury, Bell, et al. (2005) found that chiropractic care was one of the most widely used CAM modalities with 11% of North Carolina rural elders they studied that were using the modality. They also found that the elders viewed DCs as conventional health care providers. Rural DCs have been shown to see more new patients annually (Lind et al., 2009) and to have busier practices than their urban counterparts (Smith & Carber, 2002). Although the majority of patients who visit DCs are seen for musculoskeletal complaints, rural patients of DCs have also been shown to be more likely to present with non-musculoskeletal conditions than do urban patients. Many of these patients have reported that they have not used other providers while under chiropractic care (Smith & Carber,

2002). Chiropractic care has been shown to have a high rate of efficacy, especially for musculoskeletal conditions (Chou & Huffman, 2007; Lawrence & Meeker, 2007), and to be cost-effective for these conditions (Haas, Sharma, & Stano, 2005; Liliedahl, Finch, Axene, & Goertz, 2010). Chiropractic care has also been shown to be effective for some non-musculoskeletal conditions such as asthma, cervicogenic vertigo and infantile colic (Hawk, Khorsan, Ferrance, & Evans, 2007).

CAM use in rural areas including Appalachia. Referrals by physicians for all types of adjunct care including CAM are on the increase in the U.S. The percentages of rural physicians interviewed in the Southeast found to refer appropriate patients are as follows: referral to DCs (8.4%), mental health providers (58.4%), physical therapy (33%), and medical pain management (26.5%); (Martz et al., 2006). Arcury, et al. (2004) found that rural Appalachian adults visited a DC more often than any other CAM therapist. Barish and Snyder (2008) found that most of the rural Southwest Virginia mountain residents they studied used CAM, and that these therapies were deeply integrated into their beliefs and behaviors. The authors also found that study participants expressed frustration and dissatisfaction with the impersonal care and lack of access to health care they perceived among traditional health care providers. Chiropractic care was one of the CAM therapies that respondents found helpful. This may be due to the fact that patient satisfaction with chiropractic care has generally been rated very high. Carey et al. (1995) found that patients' ratings of perception of care, information given and overall results of treatment were higher for DCs than for primary care physicians, orthopedic or health maintenance organization (HMO) providers. Most studies in the

rural Appalachian region have found CAM to be used along with conventional therapy for most conditions (Arcury, Bell, et al., 2005; Barish & Snyder, 2008).

CAM use according to the Anderson Behavioral Model

The following review will be described in terms of the Andersen Behavioral Model (Aday & Andersen, 1974; Andersen, 1995) that included population characteristics described in terms of predisposing, enabling and need factors. Predisposing factors are characteristics that determine utilization or the propensity to use healthcare services. Enabling factors are described as the means available for the patient to obtain care and need factors are either those evaluated by the health care delivery system or those perceived by the individual or both.

CAM use and predisposing variables. CAM has been shown to be utilized by almost 40% of adult Americans (Barnes et al., 2008) with the highest CAM use among American Indian or Alaska Native adults (50%) and White adults (43%) as opposed to Asian adults (40%) or Black adults (26%). CAM users are predominantly middle-aged or older (Bausell, et al., 2001; Brown, Barner, Bohman, & Richards, 2009; Cheung et al., 2007; Coulter & Shekelle, 2005; Nahin et al., 2010; Scheffler-Grant, Hill, Weinert, Nichols, & Ide, 2007; Unutzer et al., 2000; Vallerand et al., 2004; Wu et al., 2007), and White (Bausell et al., 2001;Coulter & Shekelle, 2005;Fleming, Rabago, Mundt, &Fleming, 2007; Kannan, et al., 2010; Mikuls, Mudano, Pulley & Saag, 2003; Ness, Cirillo, Weir, Nisely, & Wallace, 2005; Wu et al., 2007), non-Hispanic or Chinese-American women (Barnes et al., 2008; Cheung, et al., 2007; Fleming et al., 2007; Hsiao et al., 2006; Ness et al., 2005; Unutzer et al., 2000) or Native American (Arcury, Quandt,

Bell, & Vitolins, 2002). They also have been found to be more highly educated (Brown et al. 2009; Hildreth & Elman, 2007; Kannan et al., 2010; Nahin et al., 2010). Interestingly, CAM users were either current or former smokers, and used alcohol (Barnes et al., 2008; Nahin et al., 2007; Ness et al., 2005). Marital status was not generally found to be a significant predictor of CAM use. Users of manipulative and body-based therapies, which include chiropractic or osteopathic manipulation, massage and movement therapies including t'ai chi and yoga were found to be predominantly White, divorced, females, age 30 – 59 years, who were more highly educated, with higher incomes. In contrast to all CAM users, consumers of chiropractic services have been found to be predominantly rural, older and White (Carey et al., 2002; Hawk & Long, 1999).

CAM use and enabling variables. Factors found to predict CAM use in American populations included having private insurance (Barnes et al., 2008; Cherkin et al., 2002; Del Mundo, et al., 2002; Rhee et al., 2004), higher incomes as compared with non-CAM users (Barnes et al., 2008; Del Mundo et al., 2002; Fleming et al., 2007; Hsiao et al., 2006; Kannan et al., 2010; Nahin et al., 2010; Ness et al.,2005; Wu et al., 2007) and being currently employed (Fleming et al., 2007; Wu et al. (2007). Having a usual source of healthcare (Cheung, et al., 2007; Ness et al., 2005), and living in a rural area (Smith and Carber, 2002) are also predictive of CAM use. Physical therapy (PT) referrals were more likely with private insurance coverage (Freburger, Holmes, & Carey, 2003). Vallerand et al. (2004) found that adults in rural areas with higher incomes were more likely to use opioid medications as opposed to CAM. DCs tended to see more rural versus urban patients. Chiropractic patients tended to be poorer, and to report more

difficulty obtaining health care appointments (Smith & Carber, 2002). Although a few studies have assessed transportation factors associated with rural health care, no studies were found evaluating transportation factors associated with CAM use.

CAM use and acute versus chronic conditions and perceived health status. The majority of studies have found that self-reported poor health predicted use of CAM (Bausell, et al., 2001; Cheung et al., 2007; Hildreth & Elman, 2007; Rhee et al., 2004; Wardle, Lui, & Adams, 2010; Wu et. al., 2007). However, Brown et al. (2009) and Kannan et al. (2010) found that CAM users reported having better health status as opposed to CAM non-users. Wardle et al. (2010), in their research synthesis of CAM use in rural communities, found that rural residents were significantly more likely to rate their health as poor compared with their urban counterparts.

In multiple studies it was found that need factors predicting CAM use included chronic conditions especially those requiring the use of prescription and/or over-the counter medications for management (Arcury, Grzywacz, Neiberg, Lang, et al., 2011; Fleming et al. 2007; Rhee et al 2004; Smith & Carber, 2002; Vallerand et al. 2004). People with musculoskeletal conditions including back, neck, joint problems and headaches (Carey et al., 2002; Cherkin et al. 2002; Del Mundo et al. 2002; Fleming et al. 2007; Hawk & Long, 1999; Lawrence & Meeker, 2007; Rhee et al. 2004; Vallerand et al. 2004) were also more likely to use CAM. CAM users were found to have more functional limitations, self-reported poorer health (Johnson, 1999; Wu et al., 2002) and mental and emotional disorders (Cheung, et al., 2007; Kessler et al., 2001; Unutzer et al. 2000).

Theoretical Framework

Behavioral Model of Health Services Use

The guiding conceptual framework for this study was the Andersen Behavioral Model (Aday & Andersen, 1974; Andersen, 1995) which is a framework for healthcare access that has evolved since 1968 (Andersen, 1968). The original model explored utilization of healthcare services by families. The Behavioral Model has been used extensively to study the decision to seek care and the determinants of healthcare utilization (Andersen, 2008; Andersen & Newman, 2005; Fouladbakhsh, Stommel, Given & Given, 2005; Gelberg, Andersen & Leake, 2000; Phillips, Morrison, Andersen & Aday, 1998). It has also been used more recently to explore the use of CAM (Brown, et al., 2009; Hildreth & Elman, 2007; Hsiao et al., 2003; Hsiao et al., 2006; Kannan, et al., 2010; Mikuls et al., 2003; Scheffler-Grant, et al., 2007; Willison, 2009; Zhang, Jones et al., 2008).

Description of the framework: Health policy. Aday and Andersen (1974) noted that access to health care had been viewed as a political rather than an operational idea. They wanted to create a theoretical framework that conceptualized and operationalized access to health care services. They also expanded the concept of access from a purely economic to both an economic and organizational concept. They cited a U.S. Department of Agriculture (USDA) report (USDA, 1973) that demonstrated concern for the lack of equal access to health services in rural as compared with urban areas. This report concluded that rural areas lacked adequate medical personnel and health facilities, and that rural populations had difficulty affording treatment for illness. Aday and Andersen

(1974) defined access as health care services that were readily available whenever an individual needed those services. They also made the model detailed enough to specify the point of entry into the health care system. The authors described both potential and actual entry of a population into the health care system. Figure 1 demonstrates the conceptualized framework as beginning with health policy, then flowing through both the characteristics of the health delivery system and the population at large to the final outcomes of health service utilization and consumer satisfaction (Aday & Andersen, 1974). Health policy is seen in the model as a starting point for access to care. Health planners and policy makers often cite improved access to care as a goal, and create or reorganize health care programs that include financial, manpower, education and reorganization components.

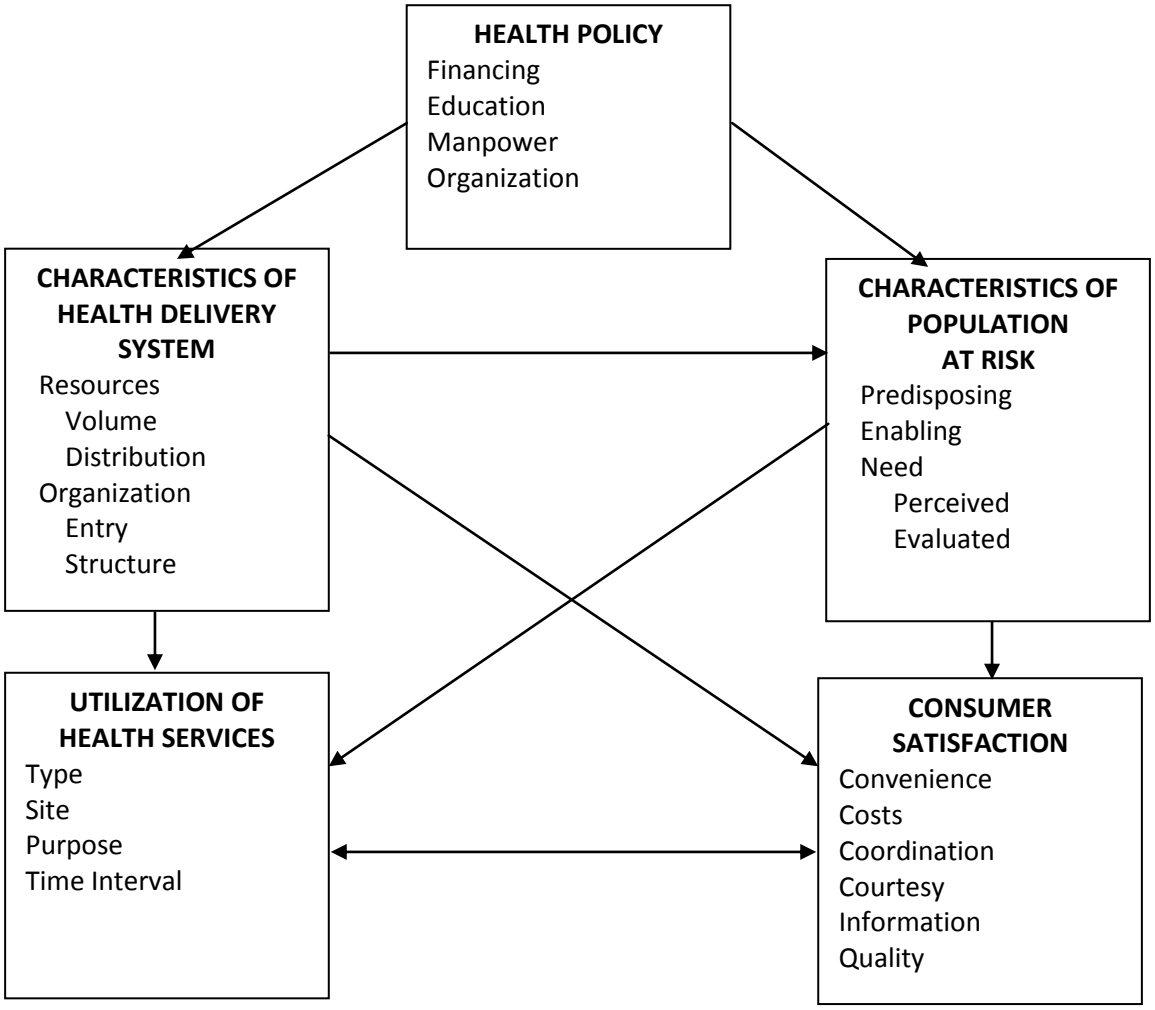

Figure 1. Framework for the Study of Access. Adapted from "A Framework for the Study of Access to Medical care," by L.A. Aday, and R.M. Andersen, 1974, *Health Services Research*, 9, 208-22.

Characteristics of the health delivery system. The delivery system within the framework (Aday & Andersen, 1974) is comprised of resources and organization. Resources consist of the capital and labor needed to provide health care. Also required to provide health care services are structure, personnel, equipment and materials. Both the volume and distribution of resources in an area are critical to access. These can be extremely limited in rural areas. Organization includes coordination of resources to

facilitate health care. Entry into the system would be evaluated in terms of travel to care, and time required to wait for care. Structure was the broad term used for care of the patient after entry into the system. Patient treatment and provider for care were included under structure. The unit of analysis for studies using this theoretical model was the delivery system or health care service.

Characteristics of the population at risk. Aday and Andersen (1974) described population characteristics in terms of predisposing, enabling and need factors. The individual is considered the unit of analysis for these characteristics. Predisposing factors are characteristics that determine utilization or the propensity to use healthcare services. They include gender, age, religion, education and values regarding health or illness. Enabling factors are described as the means available for the patient to obtain care, and include rural-urban locations, income and insurance status. Need factors are either those evaluated by the health care delivery system or those perceived by the individual or both. Examples of evaluated need would be a diagnosis made by a healthcare provider, whereas perceived need might include reported symptoms or perceived health status.

Utilization of health services. Aday and Andersen (1974) referred to health care utilization as the level and pattern of entry into the healthcare system. Utilization refers to type of provider (physician, hospital, pharmacist), site where health care was received (emergency department, physician's office), purpose for visit (preventative, illness-related or custodial), and time interval between accessing services.

Consumer satisfaction. Satisfaction with care includes attitudes toward the source of care on the part of a consumer, especially as it relates to a recent, specific episode of care. Convenience, cost, the courtesy perceived by the patient on the part of a provider, information received about the illness and perceived quality of care received describe consumer satisfaction (Aday & Andersen, 1974).

Interrelationship of factors. Characteristics of both the population at risk and characteristics of the health delivery system were shown by Aday and Andersen (1974) to be directly influenced by health policy and directly and indirectly influenced by utilization of health services and consumer satisfaction (Figure 1). Health policy directly influences characteristics of the health delivery system and characteristics of the population at risk. The health delivery system has an indirect effect on consumer satisfaction through utilization by the population. The population at risk has an indirect effect on utilization through consumer satisfaction. Utilization and consumer satisfaction show a reciprocal relationship such that utilization influences satisfaction and satisfaction influences utilization. Andersen and Aday (1978) posited that the predisposing characteristics influence utilization and consumer satisfaction both directly and indirectly through effects on enabling and need characteristics. Enabling characteristics influence utilization both directly and indirectly through need characteristics. Need has a direct effect on utilization.

Andersen (1995) created Phase 3 of the Behavioral Model as depicted in Figure 2, in the 1980s – 1990s. The phase 3 model will be used for this study. This model was developed on the premise that primary determinants of health behavior such as

population characteristics, the health care system and the external environment can maintain or improve health outcomes. These outcomes could include perceived health status, evaluated health status and consumer satisfaction. Health status is influenced by health behaviors such as personal health practices and the use of health services. The external environment includes political, physical and economic components. Personal health care practices such as diet and exercise have the potential to improve health outcomes. Lastly, health outcomes were added to demonstrate "effective access" (Andersen, 1995, p. 6) when studies reveal that use improves health status, either perceived or evaluated, and consumer satisfaction with health care. Andersen (1995) posited an indirect relationship from determinants of health behavior through health behavior to health outcomes.

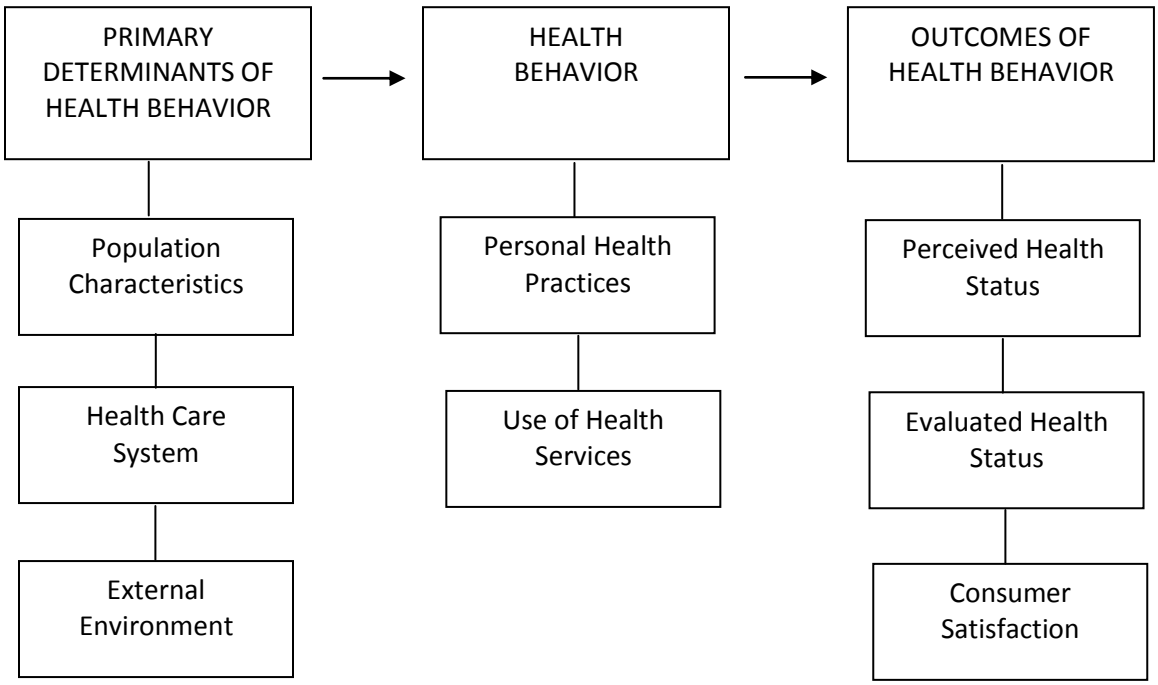

Figure 2. The Behavioral Model-Phase 3 (1980s-1990s). This is from **"**Revisiting the Behavioral Model and access to medical care: Does it matter?" by R. M. Andersen, 1995.

Theoretical assumptions. The authors of the Behavioral Model (Aday & Andersen, 1974); (Figure 1) posited that individuals gain access into the healthcare system based on their characteristics as well as their satisfaction with the services. Consumers of health care also gain access based on the characteristics of the healthcare system (Andersen & Aday, 1978). Healthcare access is not defined by the presence of healthcare systems but the use of services and perceptions of consumers regarding their healthcare (Aday & Andersen, 1974). Figure 2 shows the revised 1980s – 1990s phase 3 Behavior Model (Andersen, 1995). The author posited in the phase 3 model that improved health status and satisfaction with services is influenced by personal health practices and consumers' use or nonuse of services alongwith their personal characteristics, the health care system and the external environment.

Summary of the model. Figure 3 shows the conceptual framework that was used in this study. This model was adapted from the Phase 3 Behavioral Model of Health Services Use (Aday & Andersen, 1974; Andersen, 1995). The framework was used to investigate the relationships among the predisposing, enabling and need characteristics of the population at risk (rural adults in Southwest Virginia), and utilization of both conventional (physical therapy and counseling) and complementary healthcare services (chiropractic adjustment, massage, energy work and reflexology). Satisfaction with these therapies was not explored in this study.

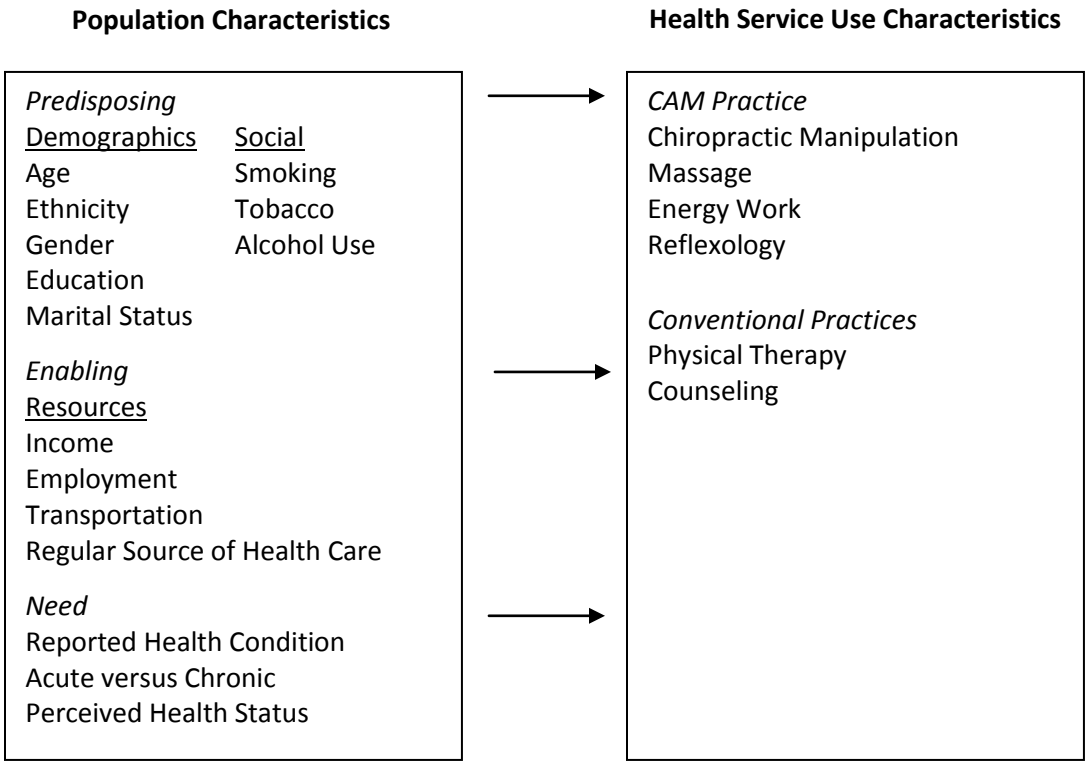

Figure 3. *Modified Andersen Model.* Adapted from "A framework for the study of access to medical care," by L. A. Aday, and R. M. Andersen, 1974, *Health Services Research,* 9, 208 – 22, and "Revisiting the Behavioral Model and access to medical care: does it matter?" by R. M. Andersen, 1995. *Journal of Health and Social Behavior,* 36 (1), 1 - 10.

Conceptual Definitions

The constructs that were used in this study were originally defined by Aday and Andersen (1974) and Andersen (1995) and have been tested in studies using the Framework for Access to Medical Care (Fouladbakhsh et al., 2005; Gelberg et al., 2000; Scheffler-Grant et al., 2007; Willison, 2009). They are defined as follows:

Characteristics of Population-at-Risk

These are defined by characteristics of rural residents that determine their use of CAM and/or conventional services. Predisposing factors in this study included individual characteristics of rural residents that describe their propensity to use CAM and/or conventional healthcare services. Enabling factors explored in this study were the means available or barriers for use of CAM and/or conventional services. These included access to a health care site for services. The need component addressed the illness or the reason for use of CAM and/ or conventional services. In this study, the respondent listed the two main problems for which they came to the chiropractic office for care and also whether they employed therapies for wellness.

Health Service Use

Health services that were explored in this study included the CAM services chiropractic adjustment/ manipulation, massage, energy work and reflexology, and the conventional services/practices counseling, and physical therapy.

Operational Definitions

Variables

Health service use. Health services that were explored in this study included the CAM services chiropractic adjustment/ manipulation, massage, energy work and reflexology and the conventional services/practices counseling, and physical therapy (see Figure 3). The CAM and conventional therapies that were studied in addition to chiropractic adjustment/ manipulation were selected because they have been used and studied for problems often treated with chiropractic (Chou & Huffman, 2007; Henschke, et al., 2010; Kanodia, Legedza, Davis, Eisenberg, & Phillips, 2010; Quinn, Hughes, & Baxter, 2008) and sources for these therapies were found to be available within these rural counties. The CAM and conventional services were described in terms of volume, that is, the number of visits to providers within the last year (See Appendix A for Study Questionnaire).

Predisposing factors. The predisposing factors included the population characteristics of predisposing, enabling and need factors. Predisposing factors included a) age, b) ethnicity, c) gender, d) education, and e) marital status. Age was operationalized with a continuous level question that asked respondents to indicate their age. Ethnicity was operationalized with nominal level questions that included a) Caucasian or White, b) African American or Black, c) Hispanic/Latino American, d) Asian American, e) Native American, f) other or g) prefer not to answer. Gender was operationalized with a nominal level question that asked respondents to indicate their gender. Education was operationalized with an ordinal level question that includes a) less

than high school diploma, b) high school diploma or General Education Development test (GED), c) some college or technical school, d) technical school diploma, e) college degree, f) graduate or professional degree, and g) prefer not to answer. Marital status was operationalized with a nominal level question that includes a) single, b) married, c) separated, d) divorced, or e) widowed.

Predisposing factors also included the social factors of alcohol and tobacco use. Alcohol use was operationalized with a nominal level question that inquired about use or non-use of alcoholic beverages in the last 6 months. If there was alcohol use, the respondents was asked to quantify the use by a response of a) every day, b) nearly every day, and c) X times per month. Cigarette smoking was operationalized with an ordinal level question that inquired whether the respondent smoked a) every day, b) some days, or c) not at all. A second ordinal tobacco question inquired about the current use of any other tobacco products including use of chewing tobacco, dip or snuff. This was quantified by requesting a response of a) every day, b) some days, or c) not at all.

Enabling factors. Enabling factors included a) employment status, b) health insurance status of respondent and family, c) income level, d) transportation, and e) having a regular source of care. Income status was operationalized with an ordinal level question that asked respondents to rank their income into five levels. Choices included a) less than $15,000, b) $15,000 to $24,999, c) $25,000 to $34,999, d) $35,000 - $49,999, e) greater than $50,000 per year, and f) prefer not to answer. Employment status was operationalized with a nominal level question that included response options a) working full-time, b) working part-time, c) not working, or d) disabled. Insurance status for both

the respondent and the family was operationalized with a nominal level question that included the response options a) private insurance, b) Medicare, c) Medicaid, d) Veterans Administration (VA) benefits, d) uninsured and e) other. The respondent was instructed to check all that apply.

Having a regular source of healthcare was operationalized with three questions. The first question inquired about the use of a regular source of health care in the past year. Responses were operationalized with the following nominal level responses: a) private office primary care provider such as doctor, nurse practitioner, or physician's assistant, b) public clinic such as the health department, c) chiropractor, d) urgent care clinic, e) hospital emergency department, and f) I have not used any source for my regular health care. The second question inquired about barriers to seeing a regular source of health care. If the respondent had not used any health provider for a regular source of health care, they were asked to give a reason for this with one of the following nominal level responses: a) I don't have good or reliable transportation, b) I don't have a regular source of healthcare/ primary care provider, c) I can't afford to see one, d) I don't want to see one, and e) I don't need to see one. The third question regarding going to a regular health care provider inquired about the reason for the visit with the following nominal level responses: a) physical or check-up, b) to get medications, c) when I am sick or injured, d) other, please write in, and e) does not apply.

Another question inquired whether the respondent had used the following therapies in the past year with the following nominal level questions: a) chiropractic manipulation, b) physical therapy, c) reflexology, d) massage therapy, e) counseling for

mental health or emotional concerns, and f) energy work/ therapy such as Reiki. Transportation to a health care provider was operationalized with a question that inquired as to the mode of transportation used by the respondent to access a regular source of healthcare. Nominal level responses included a) driving myself, b) having someone else drive me, and c) using the bus or some other public transportation.

Need factors. Need factors included reported health conditions and perceived health status. Respondents were asked to describe the top two health conditions for which they sought health care in the last year. Health conditions were identified as acute versus chronic based on the time frame the respondent had experienced the health condition. This was a nominal level question. Conditions experienced for less than 3 months were labeled acute, while those lasting 3 months or greater were labeled chronic (Chou & Huffman 2007; Saydah & Eberhardt, 2006). Respondents were also asked to indicate if they were seen for the health service for well-being or for another condition which they were asked to specify. Perceived health status was operationalized with an ordinal level question. Responses included excellent, very good, good, fair, and poor with higher scores indicating better health status (See Appendix A for Study Questionnaire).

Assumptions of the Behavioral Model

An assumption of the Behavioral Model (Aday & Andersen, 1974; Andersen, 1995) is that individuals gain access to chiropractic care and the other health care modalities included in this study based on their predisposing, enabling and need characteristics. Rural consumers of health care also gain access based on the

characteristics of the healthcare system. It is known that primary care providers are scarce in the rural Appalachian area and that many rural residents utilize chiropractic care for both musculoskeletal as well as non-musculoskeletal conditions. An assumption based on the model and the literature is also that rural Southwest Virginia residents use a DC as a regular health care provider.

Summary

Use of CAM, including chiropractic care, appears to be wide-spread in rural areas, although research on this topic is limited. It is known that chiropractic care has been found to be used for both musculoskeletal and non-musculoskeletal conditions, and that the rates of chiropractic care are higher for rural as compared with urban residents. Although there are a few studies evaluating sociodemographic and need variables associated with chiropractic use, little is known about the major health problems, demographic profiles, and CAM and conventional therapies reported by rural Appalachian chiropractic patients.

Knowledge regarding patterns of health care use in rural Appalachian residents will be useful for health care providers and public policy makers and will provide valuable information with which to create and improve existing health care for these residents. The goal of this study was to gain a better understanding of selected CAM and conventional therapy use among Appalachian residents in order to improve health care outcomes in rural underserved Appalachian areas.

CHAPTER II

REVIEW OF THE LITERATURE

This review includes studies examining the concepts in the Andersen Behavioral Model (Aday & Andersen, 1974; Andersen, 1995). These concepts include population characteristics and health service use as they relate to CAM and conventional health care, especially in rural Appalachian populations. Population characteristics include predisposing, enabling and need variables. Predisposing or demographic and social variables include age, ethnicity, gender, education, and marital status. Social variables include alcohol and tobacco use.

Enabling factors include employment status, income level, health insurance status, transportation and having a regular source of care. Need factors include acute and chronic health conditions. Health service use includes CAM and conventional practice. CAM practices include chiropractic manipulation, reflexology, massage therapy, energy therapy or other therapy, and the conventional practices include counseling and physical therapy. In addition, the relationships between predisposing, enabling and need variables and use of CAM and conventional practices have been examined. The literature spans from 1999 to 2011 and is particularly focused on studies that review rural Appalachian residents.

Population Characteristics and Health Service Use

CAM versus conventional use and predisposing variables

CAM use has been found to be reported as ranging from 40% (Barnes, Bloom & Nahin, 2008) to 63.8% of American adults (Kannan, Gaydos, Atherly, & Druss, 2010), using national datasets with the majority of respondents using both CAM and conventional care together (Kannan et al., 2010). Chiropractic therapy is one of the most widely used forms of CAM. Wardle, Lui, and Adams (2010), in their research synthesis of CAM use in rural communities found that Doctors of Chiropractic (DCs) and massage therapists were the most widely used CAM therapists in North America and Australia. Ness, Cirillo, Weir, Nisely and Wallace (2005), in a nationally representative sample, found that 88% of respondents used some form of CAM, with 46% reporting use of chiropractic therapy. Wu et al. (2007) explored CAM in adult women from four ethnic groups with depression in the U.S. Fifty-four percent of the sample had used CAM and 26% had used manual therapies, such as chiropractic manipulation within the previous year. Zhang et al. (2008) explored factors predicting CAM use in low-income primary care patients in rural West Texas. Fifty-two percent of patients used CAM which was provided by DCs (42.7%), massage therapists (33.3%) and herbalists (8.3%). Arcury, Grzywacz, Neiberg, Lang, et al. (2011) studied rural North Carolina dwellers age 65 and older, and found that 85% used some form of home remedy with 28% using herbs and 25% visiting DCs. Arcury, Quandt, Bell and Vitolins (2002) evaluated the CAM and home remedy use of rural North Carolina adults age 70 and older. They found that over 40% of the respondents used home or folk remedies and 11% visited DCs. Del Mundo,

Sheperd and Marose (2002) studied the patterns of CAM use in a sample of rural primary care patients in Pennsylvania, and found that 47% of those surveyed used some type of CAM, with chiropractic therapy being the most common CAM method used (17%).

The literature is growing regarding the increased use of DCs in rural and underserved areas. Smith and Carber (2002), in their survey of DCs nationwide, found that 88% of the providers reported provision of care to patients from health professional shortage areas (HPSAs). The authors found that those with rural and HPSA locations had the busiest practices. DCs in very rural HPSAs areas saw more new patients per year compared with those in urban non-shortage areas. Nichols, Weinert, Shreffler Grant, and Ide (2006) found that older rural residents had limited availability of CAM providers and that of these, DCs were the most commonly used by these residents.

Rural residents and those in poverty have also been found to have limited access to psychotherapy and physical therapy (PT) treatment. Fortney, Harman, Xu, and Dong (2010) studied a nationally representative sample of individuals diagnosed with depression. They compared the methods of treatment for depression, including anti-depressant medication and psychotherapy used by rural as compared with urban residents. The authors found that 65% of the respondents that were identified with depression received some type of treatment. Rural residence was found to be associated with higher odds of receiving treatment with medication and lower odds of receiving psychotherapy treatment. Freburger, Holmes, and Carey (2003) used the National Ambulatory Medical Care Survey data to evaluate patterns of physician referrals to PTs

in patients with musculoskeletal complaints. The authors found that impoverished patients were less likely to be referred for PT.

The following review investigated current literature related to variables in the study.

Age. The age of the person using CAM has been found to be significant in several studies. In most studies, CAM users have been found to be predominantly middle-aged or older (Bausell, Lee, & Berman, 2001; Brown, Barner, Bohman, and Richards, 2009; Cheung, Wyman & Halcon, 2007; Coulter & Shekelle, 2005; Nahin, Dahlhamer, & Stussman, 2010; Scheffler-Grant, Hill, Weinert, Nichols, & Ide, 2007; Unutzer et al., 2000; Vallerand, Fouladbakhsh & Templin, 2004; Wu et al., 2007). Bausell et al. (2001) found in a nationally representative sample that those ages 40 – 49 were significantly more likely to use CAM as compared with younger or older adults. Coulter and Shekelle (2005) used stratified sampling of American adults and found that the average chiropractic consumer was 42 years of age. However Nahin et al. (2010), in a nationally representative sample, found significantly higher levels of use in those 25 - 44 years (48% of sample) as opposed to those 45 – 64 years (27% of sample). They also found that young and middle-aged adults (15 – 64 years) made the majority of the visits to CAM providers. Hsiao et al. (2006) studied CAM use specific to ethnicity in ethnically diverse adults in California. The authors found that older Asian Americans were significantly more likely to use Asian-specific CAM such as Chinese medicine, while older Blacks were less likely to use CAM specific to Blacks. Wu et al. (2007) explored CAM use in adult women with depression and found that use of manual therapies such as

chiropractic manipulation or massage was significantly higher in those 35 years of age and older. Vallerand et al. (2004) studied the self-treatment methods of rural adults with daily pain. Age was found to be significantly correlated with use of CAM, with CAM users having a mean age of 54 years and non-users 61 years. In a study conducted in Minnesota, the highest level of CAM use was in the respondents who were 65 – 74 years of age as opposed to those older than 75 (Cheung et al., 2007). Similarly, Scheffler-Grant et al. (2007) found the highest level of CAM use in rural Western women to be among those ages 60 – 69 as opposed to those ages 70 and older. Brown et al. (2009) studied Black adults who used CAM, and found that inclusion of prayer for health reasons increased reported CAM use in this sample from 27% to 70%. Age was a significant predictor of CAM use, with the highest level of use in the middle-aged to older (35 – 44; 45 – 54) group. Users of manipulative and body-based therapies, which include chiropractic or osteopathic manipulation, massage and movement therapies, including t'ai chi and yoga, were found to be highest in the 30 – 59 year age group. In contrast to all CAM users, those that use chiropractic services have been found to be predominantly older (Carey et al., 2002; Hawk & Long, 1999).

Ethnicity. Ethnicity has been found in many studies to be a predictor of CAM use. In the majority of studies, Whites as compared with other ethnic groups **(**Bausell et al., 2001;Coulter & Shekelle, 2005;Fleming, Rabago, Mundt, and Fleming, 2007; Kannan et al., 2010; Mikuls, Mudano, Pulley & Saag, 2003; Ness et al., 2005; Wu et al., 2007) or Native Americans **(**Arcury et al., 2002;Barnes et al., 2008) had the highest levels of CAM use. Barnes et al. (2008) in a nationally representative sample, found the highest CAM

use among American Indian or Alaska Native adults (50%) and White adults (43%) as opposed to Asian adults (40%) or Black adults (26%). In contrast to all CAM users, consumers of chiropractic services have been found to be predominantly White (Carey et al., 1995; Hawk & Long, 1999). Ness et al. (2005) found that among adults ages 52 and older, Whites were more likely to use CAM overall and alternative practitioners such as DCs, in particular. Black respondents were less likely to visit an alternative practitioner compared with White respondents. Bausell et al. (2001) found that Blacks and Hispanics were statistically less likely to visit a CAM provider. Nahin et al. (2010) also found the highest use of CAM in those who were non-Hispanic and other than White or Black. Hsiao et al. (2006) found that Asian respondents living in California had a significantly higher percentage of ethnic specific use of CAM, such as the use of Chinese medicine for Asians, as compared with other ethnic groups. Visits to DCs were made (in descending order) by Americans Indians (48%), Whites (44.6%), Blacks (33%), Asian Americans (23.6%) and Latinos (22.7%). Interestingly, Wu et al. (2007) reported that among multi-ethnic women with depression, Chinese-American women and non-Hispanic White women were the most likely to use CAM as compared with Mexican American and Black women. Arcury et al. (2002) studied rural dwelling older North Carolina adults that were stratified by ethnicity. They also found that significantly more Native American and Black respondents used home remedies and that Native Americans were from two to five times more likely to use home remedies and five times more likely to visit DCs when compared with other groups.

Mikuls et al. (2003), exploring access to health care for arthritis in rural and urban older adults in Alabama, found that Whites were significantly more likely than Blacks to have used CAM for their arthritis (33% versus 23%), to use chiropractic care (14% versus 10%) and to use glucosamine and/or chondroitin (18% versus 7%). White respondents were also significantly more likely than Blacks to receive care from a rheumatologist (18% versus 13%) or a primary care provider (PCP) (89% versus 76%) for arthritis care.

Gender. Women have been found to have significantly higher use of CAM in the vast majority of studies **(**Barnes et al., 2008; Brown et al., 2009; Cheung et al., 2007; Coulter & Shekelle, 2005; Fleming et al., 2007; Hildreth & Elman, 2007; Kannan et al., 2010; Nahin et al., 2010; Ness et al., 2005; Unutzer et al., 2000; Vallerand et al., 2004; Wolsko, Eisenberg, Davis, Ettner, & Phillips, 2002; Wardle et al., 2010; Zhang et al., 2008). However, Del Mundo et al. (2002) found that gender was not a significant predictor of CAM use.

Education. Generally, those with higher levels of education have been found to use CAM (Arcury et al., 2002; Bausell et al., 2001; Fleming et al., 2007; Kannan et al., 2010; Ness et al., 2005; Scheffler-Grant et al., 2007; Unutzer et al., 2000; Wardle et al., 2010; Wu et al., 2007; Zhang et al., 2008). Kannan et al. (2010), in a nationally representative study, found that 31% of CAM users had some college education, and 34% had a Bachelor's degree or higher. Users of manipulative and body-based therapies, which include chiropractic or osteopathic manipulation, massage and movement therapies including t'ai chi and yoga were found to be predominantly more highly educated.

Hildreth and Elman (2007) found that some college versus no high school diploma was the only significant predisposing factor associated with conventional service use; a high school diploma or more education was predictive of CAM use. Brown et al. (2009) in studying Black adults found similar findings related to education and use of CAM as did Zhang et al. (2008), studying patients in rural West Texas, and Fleming et al. (2007) studying rural and urban adults with chronic pain. However, Ness et al. (2005) found that among adults ages 52 and older, those with more education were less likely to use a DC. Mikuls et al. (2003) reported that those with education beyond high school were significantly more likely to receive care from a rheumatologist. They noted that the finding that rural Alabama residents with less education were less likely to see a specialist was significant because rural adults have been reported to have more diagnosed arthritis including osteoarthritis (Mikuls et al., 2003).

Marital status. Although marital status has not been a good predictor of CAM use (Kessler et al., 2001; Mikuls et al., 2003; Wu et al., 2007), a few studies have found that those who were not married or in a domestic partnership were significantly more likely to use CAM (Hildreth & Elman, 2007; Scheffler-Grant et al., 2007; Wardle et al., 2010). In contrast, Coulter and Shekelle (2005) found that chiropractic patients were predominantly married.

Alcohol and tobacco use. Findings regarding the use of alcohol and tobacco as a predictor of CAM have been mixed. Kannan et al. (2010) found that those who smoked less were significantly more likely to use CAM. Cheung et al. (2007) found that CAM users were more likely to be non-smokers, but alcohol use was non-significant in the

analysis. In contrast, others (Barnes et al., 2008; Nahin et al., 2010) have found that CAM users were either current or former smokers and used alcohol (Barnes et al., 2008; Nahin et al., 2007; Nahin et al., 2010; Ness et al., 2005). Nahin et al. (2010) reported that CAM users were significantly more likely to be moderate to heavy drinkers or former drinkers.

CAM versus conventional use and enabling variables

Income. Generally, those who use CAM have been shown to have significantly higher income levels **(**Barnes et al., 2008; Del Mundo et al., 2002; Fleming et al., 2007; Kannan et al. 2010; Nahin et al. 2010; Ness et al., 2005). Significant findings by Nahin et al. (2010), using the 2002 National Health Interview Survey (NHIS) dataset found that American CAM users also delayed conventional health care due to cost and/or non-cost factors. Del Mundo et al. (2002), in their study of CAM use in a sample of rural primary care patients found that CAM users had an annual income significantly greater than $35,000 as compared with non-CAM users. Fleming et al. (2007) found that adult CAM users with chronic pain were significantly more likely to have higher incomes. Ness et al. (2005) found that higher incomes in middle aged and older Americans were associated with more frequent use of CAM. Those in the highest income quartile (income > $60,001 per year) were significantly more likely to use a CAM provider. Hildreth and Elman (2007) evaluated the use of conventional and CAM health service use in a nationally representative sample that included both community and individual resources. These included imputed income, which was based on reported occupation and self-reported perceived financial status, insurance and available medical care. Only perceived

financial status was a significant predictor of health service use, with respondents who had better perceived finances having visited conventional providers less often. Hsiao et al. (2006), studying enabling factors that predicted the use of CAM in ethnically diverse adults in California, found that White respondents with higher incomes were more likely to use White-specific CAM compared to those with incomes less than $10,000.

Other studies have not found income to be significantly associated with CAM use (Cheung et al., 2007; Kessler et al., 2007; Sheffler-Grant et al., 2007). Cheung et al. (2007) found that CAM users versus nonusers in a randomized sample of Minnesota adults could not be significantly differentiated by income.

Employment. Employment has been found to be a significant enabling factor for CAM use in some studies (Fleming et al., 2007; Wu et al., 2007)**.** Fleming et al. (2007) found that adult CAM users with chronic pain were significantly more likely to be currently employed (49.9% versus 38%) as compared with non-CAM users. Wu et al. (2007), in their study of CAM use in adult women with depression, found that unemployed women were significantly less likely to use CAM compared with employed women. However, a few studies did not find employment to be a significant predictor of CAM use. For example, Sheffler-Grant et al. (2007) did not find employment to be a significant factor for the use of CAM in a sample of rural western women and Kessler et al. (2001) did not find employment to be a significant predictor in a nationally representative sample of adults with anxiety and depression.

Health insurance. Most studies have found that having health insurance is a significant enabling factor in CAM use (Barnes et al., 2008; Cherkin et al., 2002; Kannan

et al., 2010; Rhee, Garg, & Hershey, 2004; Wolsko et al., 2002; Zhang et al., 2008). Barnes et al. (2008), using the 2007 NHIS dataset, found that CAM users who were younger than 65 had private health insurance, compared with those who had public or no health insurance. Wolsko et al. (2002) found that frequent CAM use, defined as 8 or more visits to a CAM provider per year, was significantly associated with full insurance that covered the CAM provider. Rhee et al. (2004) found that frequent users of CAM providers were more likely to either have full or partial insurance coverage. Cherkin et al. (2002), who studied characteristics of four types of CAM providers, found that more than 80% of patients who visited DCs were self-referred, and that 57% to 68% of visits to DCs were covered by insurance. Zhang et al. (2008), evaluating low income primary care patients in rural west Texas, found that having private health insurance was a significant predictor for the use of CAM providers.

A few studies however, have reported that health insurance was not a predictor of CAM use, and that many spend out-of-pocket money to visit CAM providers. Eighty percent of Minnesota CAM users in one study reported that their CAM use was "not at all" influenced by insurance coverage (Cheung et al., 2007, p. 1002). Nahin et al., (2009) found that manipulative and body-based therapies, including chiropractic care accounted for about 75% of out-of-pocket spending on practitioners.

Use of conventional therapy such as PT can also be predicted with the availability of private insurance. Freburger et al. (2003), in a nationally representative sample, found that physicians were 35% more likely to refer to physical therapists if patients had private insurance, as opposed to Medicaid or a managed care plan. The authors noted that this

finding was consistent with other studies demonstrating that those in poverty have decreased access to medical and surgical interventions.

Transportation. Although it is known that transportation is a significant barrier to healthcare access for rural residents who often need to drive long distances to see health care providers (Arcury, Preisser, Gesler, & Powers, 2005; Barish & Snyder, 2008, Butler, 2006; Chan, Hart, & Goodman, 2005; Huttlinger, Schaller-Ayers, & Lawson, 2004; Institute of Medicine of the National Academies [IOM] 2005; Kemp, 2008, McCarthy & Blow, 2004; National Rural Health Association [NHRA], 2011; United Health Center for Health Reform & Modernization [UHCHRM], 2011), little is known about transportation to CAM providers. Barish and Snyder (2008) reported that transportation barriers existed to accessing healthcare for a sample of underserved rural Southwest Virginia residents. Almost one-third of these did not own a vehicle. Kemp (2008) reported concerns of residents that hospital access was difficult due to a significant distance to travel, and that there was no public transportation within Floyd County, one of the counties in the current study. Chan et al. (2005) found that rural residents in five U.S. states including North Carolina had increased travel distance and time and stayed within rural areas for most of their visits to physician and non-physician providers. Sheffler-Grant et al. (2005) found that a sample of older adults in a very sparsely populated (2.5 – 8.6 persons per square mile) western area travelled from 1 to 600 miles to see a regular provider with a mean distance of almost 30 miles. Only 17.5% of these residents used a CAM provider although 45% reported CAM use. Studies addressing transportation as a barrier to the use of CAM were not found.

Regular source of health care. Some studies evaluating the use of CAM and conventional care have found that having a regular source of health care predicts the use of CAM. Kannan et al. (2010) found that western American adults who had a usual source of healthcare were significantly more likely to use CAM. Johnson (1999) evaluated the CAM use of older rural western women and found that 84% used CAM in conjunction with traditional medicine. CAM users have also been found to visit conventional providers more often than do non-users of CAM (Barnes et al., 2008; Brown et al., 2009 Kannan et al., 2010). Ness et al. (2005) found that more frequent visits to traditional providers (20+ in 2 years) were significantly associated with visits to alternative practitioners as did Cheung et al. (2007) who found that CAM users reported significantly more clinic visits during the previous year. In contrast, Nahin, et al. (2010) in their study using the 2002 NHIS data found that over 19% of those surveyed did not use any conventional care in the previous year, although almost 40% reported health problems. Of those, almost 25% used alternative medicine.

An emerging finding is that some patients see their DC as their PCP (Cambron, Cramer, & Winterstein, 2007; Cooper & McKee, 2003; Leach, 2010). Cambron et al. (2007) found that 19% of chiropractic patients viewed their DC also as a PCP and the most frequent reason they went to the DC was for musculoskeletal complaints. In addition, Cambron et al. (2007) found that 69% of respondents agreed that DCs could treat hypertension, 65% sinusitis and 45% anxiety and depression.

CAM versus conventional use and need variables

Self-reported health. The majority of studies have found that self-reported poor health predicted use of CAM (Bausell, et al., 2001; Cheung et al., 2007; Hildreth & Elman, 2007; Rhee et al., 2004; Wardle et al., 2010; Wu et. al., 2007). Zhang et al. (2008), evaluating the need factors of low income primary care patients in rural west Texas, found only that respondents worries about health in the previous 30 days significantly predicted use of CAM. However, Brown et al. (2009) and Kannan et al. (2010) found that CAM users reported having better health status as opposed to CAM non-users. Wardle et al. (2010) in their research synthesis of CAM use in rural communities found that rural residents were significantly more likely to rate their health as poor, as compared with their urban counterparts.

Chronic and acute conditions. CAM use among adults with chronic disease has been explored by Saydah and Eberhardt (2006). They classified health conditions as "chronic" if they had been present in the individual for three months or longer, or if they were generally considered incurable once acquired. Chronic conditions according to the NHIS includes arthritis, heart disease, cancer, diabetes and lung disease, while Saydah and Eberhardt (2006) described chronic conditions as those requiring daily care and often requiring multiple medications for their management. These authors found that 54.5% of adults with two or more chronic conditions were CAM users and that chronic disease significantly predicted the use of CAM. Other studies that have found a significant association between CAM use and chronic conditions include those by Arcury, Grzywacz, Neiberg, Nguyen et al. (2011), Cherkin et al., (2002), Hildreth and Elman,

(2007), Hsiao et al. (2006), Nahin et al. (2010), Sheffler-Grant et al. (2007), and Wardle et al. (2010). A strong association was found between CAM use and chronic illness in a study of older rural western women. The odds of CAM use increased by 46% with each additional chronic illness reported by the respondents (Scheffler-Grant et al., 2007).

Those with multiple health conditions (Barnes et al., 2008; Brown et al., 2009; Cheung et al., 2007; Nahin et al., 2010; Rhee et al., 2004) and also acute conditions (Cherkin et al., 2002; Nahin et al., 2010) have been found to be more likely to use CAM. Nahin et al. (2010), using the 2002 NHIS dataset found that 27% of respondents with one or more health needs used practitioner-based therapies, with 24% using manipulative and body-based therapies such as chiropractic care. Interestingly, 24% of those individuals with one or more health needs reported their belief that conventional medical care would not help their condition(s).

CAM users are significantly more likely to be seen for musculoskeletal problems including back problems (Cherkin et al., 2002; Del Mundo et al., 2002; Lawrence & Meeker 2007; Nahin et al., 2010; Rhee et al., 2004; Vallerand et al., 2004; Wolsko et al., 2002), neck problems (Rhee et al., 2004; Vallerand et al., 2004; Wolsko et al., 2002), and joint problems (Arcury, T. A., Grzywacz, J. G., Neiberg, R. H., Nguyen, et al., 2011; Brown et al., 2009; Cheung et al., 2007; Johnson, 1999; Saydah & Eberhardt, 2006). Del Mundo et al. (2002) found in their study of CAM use in a sample of rural primary care patients, that CAM was used most often for back pain (31%), stress/anxiety (30%), and other musculoskeletal pain (28%). Chiropractic therapy was the most common CAM method used (17% of the sample). Cherkin et al. (2002), in their study of visits to four

types of CAM providers, found that the top five reasons for visits to DCs included in descending order: back symptoms (41 – 44%), neck symptoms (23 – 25%), wellness (9 – 10%), headache (5 – 7%) and shoulder symptoms (3 – 4%).

Hoffman, Meier, & Council (2002) found that rural North Dakota residents were treated for back pain (42.9%), leg pain (28.6%) and hand and wrist pain (14.3%). These residents were treated primarily with medication (60.3%), followed by chiropractic therapy (39.7%) and physical therapy (28.6%). Lawrence and Meeker (2007) conducted a descriptive review of 137 studies investigating rates of use of therapies used by CAM providers in the management of low back pain (LBP) and other conditions. They found that 6 to 12% of the population sought help from DCs, mostly for LBP. Freburger et al. (2003) found that patients who were referred to PTs tended to have musculoskeletal problems, including low back pain and other spine disorders, sprains, strains and fractures or dislocations.

CAM is often used to treat arthritis. Saydah and Eberhardt (2006) found that arthritis sufferers were found to have the highest use of CAM, including manipulative therapies, compared with other chronic disease sufferers. Mikuls et al. (2003) found that older adults with joint symptoms including joint stiffness, a diagnosis of rheumatoid arthritis and prior joint surgery were more likely to receive rheumatology care. Other reasons for using CAM include recurring pain (Brown et al., 2009; Cherkin et al., 2002; Cheung et al., 2007; Vallerand et al., 2004), and headache (Brown et al., 2009; Cherkin et al., 2002; Hoffman, et al., 2002; Johnson, 1999; Vallerand et al., 2004). In studying the use of CAM and conventional therapy in rural communities, Arcury, Grzywacz, Neiberg,

Nguyen et al. (2011), studying older rural multi-ethnic North Carolina residents, found that 99% of those reported chronic conditions. The authors found that the majority of the sample reported using CAM in the last 12 months and previous 3 months. Home remedies were used by 85%, CAM practitioners were used by 26% and DCs in particular were visited by 8%. Physical therapists were visited by 14.5% of the sample. Vallerand et al. (2004) found that rural patients experienced daily pain in legs and feet (57%), arms, shoulder and hands (47%), back (41%), and head and neck (34%), with 53% reporting pain at more than one site. Activities most affected by pain included sleep, work and mood. Thirty-five percent of respondents used CAM.

Summary of Current Knowledge

In summarizing the literature on CAM versus conventional therapies for acute and chronic conditions, generally CAM users were found to be middle-aged and older (Bausell, et al., 2001; Brown, et al., 2009; Cheung, et al., 2007; Coulter & Shekelle, 2005; Nahin, et al., 2010; Scheffler-Grant, et al., 2007; Unutzer et al., 2000; Vallerand, et al., 2004; Wu et al., 2007) were more likely to be privately insured (Barnes et al., 2008; Cherkin et al., 2002; Del Mundo et al., 2002; Rhee et al., 2004; Wolsko et al., 2002; Zhang et al., 2008), and those who were privately insured receive physical therapy referrals (Freburger et al., 2003) and are White (Bausell et al., 2001;Coulter & Shekelle, 2005;Fleming, et al., 2007; Kannan, et al., 2010; Mikuls, et al., 2003; Ness et al., 2005; Wu et al., 2007) or Native American (Arcury et al., 2002). Findings also indicated that CAM users were more highly educated (Brown et al. 2009; Hildreth & Elman, 2007; Kannan et al., 2010; Nahin et al., 2010), had higher incomes (Barnes et al., 2008; Del

Mundo, et al., 2002; Fleming et al., 2007; Hsiao et al., 2006; Kannan et al., 2010; Nahin et al., 2010; Ness et al., 2005; Wu et al., 2007), a regular source of healthcare (Kannan et al., 2010) and made frequent visits to conventional providers (Barnes et al., 2008; Brown et al., 2009 Kannan et al., 2010). They also tended to be either non-smokers or former smokers (Kannan et al., 2010; Nahin et al., 2010), who drink some alcohol (Barnes et al., 2008; Nahin, et al., 2007; Nahin, et al., 2010; Ness, et al., 2005). As for employment, CAM users were more likely to be currently employed (Fleming et al., 2007; Wu et al., 2007).

As for chronic illnesses, CAM users were more likely to experience chronic illness (Arcury, Grzywacz, Neiberg, Nguyen et al., 2011; Cherkin et al., 2002; Hildreth & Elman, 2007; Hsiao et al., 2006; Nahin et al., 2010; Sheffler-Grant et al., 2007; & Wardle et al., 2010). They are more likely to have functional limitations (Brown et al., 2009; Nahin et al., 2010; Ness et al., 2005), and self-reported poorer health (Bausell, et al., 2001; Cheung et al., 2007; Hildreth & Elman, 2007; Rhee et al., 2004; Wardle et al., 2010; Wu et. al., 2007). The chronic conditions more likely to be reported by CAM users compared with non-CAM users are musculoskeletal conditions including back, neck and joint problems and headaches (Cherkin et al., 2002; Del Mundo et al., 2002; Fleming et al., 2007; Lawrence & Meeker, 2007; Rhee et al., 2004; Vallerand et al., 2004). Individuals with mental and emotional disorders (Brown et al., 2009; Cheung, et al., 2007; Kessler et al., 2001; Nahin et al., 2010; Sheffler-Grant et al., 2007; Unutzer et al., 2000) and one or more health conditions also tended to use CAM. Rural residents with depressive symptoms were more likely to use anti-depressant medications rather than

psychotherapy (Fortney et al., 2010). Some patients reported using a DC as a primary care provider (Cambron et al., 2007; Cooper & McKee, 2003; Leach, 2010).

Although it is known that transportation is a significant barrier to health care access for rural residents (Arcury, et al., 2005; Barish & Snyder, 2008, Butler, 2006; Chan, et al., 2005; Huttlinger et al., 2004; IOM, 2005; Kemp, 2008, McCarthy & Blow, 2004; NRHA, 2011; UHCHRM, 2011), little is known about transportation to CAM providers. This is an area that needs to be explored.

Gaps in the Research

Use of CAM, including chiropractic care, appears to be wide-spread in rural areas, although research on this topic is limited. It is known that rural residents use chiropractic care at higher rates than do urban residents. Although there are a few studies evaluating sociodemographic and need variables associated with chiropractic use, little is known about the demographic profiles, major health problems and CAM and conventional therapies reportedly used by rural Appalachian chiropractic patients to treat these health problems. Further, no studies were found for this purpose guided by the Andersen model.

It is known that rural Appalachian residents suffer from increased morbidity and mortality, and that these significant health disparities are compounded by access barriers to care including poverty, lack of insurance, transportation issues and fewer health care providers. It is hoped that this study will contribute to an important body of knowledge that is needed to improve health care for these residents.

CHAPTER III

METHODOLOGY

Design

A non-experimental descriptive cross-sectional design was employed to determine the demographic profiles, the major reported health problems and which complementary and alternative (CAM) and conventional treatments a sample of rural southwest Virginia chiropractic patients used for these health problems. Differences in patient profiles among patients with acute and chronic problems and between chiropractic and non-chiropractic problems were also analyzed.

The study utilized a set of demographic variables representing predisposing, enabling and perceived need characteristics within the context of the Aday and Andersen model (Aday & Andersen, 1974; Andersen, 1995). These characteristics included the predisposing factors of age, ethnicity, gender, education, marital status and also tobacco and alcohol use; the enabling factors of employment status, insurance status of respondent and family, income level, barriers to seeing a regular source of healthcare and transportation; and the need factors of reported health conditions and perceived health status.

Setting

The study was conducted in three rural Appalachian counties in **S**outhwest Virginia: Floyd, Lee and Wise. These three counties have been designated by the Office

of Management and Budget ([OMB], (Virginia Rural Health Plan, 2008) as Health Provider Shortage Areas (HPSAs) (Health Resources & Service Administration [HRSAa] (2011), as well as Medically Underserved Areas (MUAs) (HRSAb, 2011). These counties were designated as rural because they have a population density less than 1,000 people per square mile. Floyd, Lee and Wise counties have very low population densities of 40.2, 58.8 and 102.8 persons per square mile respectively according to the 2010 census (U.S. Census, 2012).

Sample

A convenience sample of residents in three rural Appalachian counties in Southwest Virginia was recruited for the study. Inclusion criteria were a) adults who were 18 years and older, b) who were able to speak, read and write English, and c) who had been seen in one of the participating chiropractic offices for chiropractic manipulation within the past 12 months. The exclusion criteria was any patient who had not been seen for any type of chiropractic manipulation within 12 months.

The providers in all chiropractic offices in the three counties were approached about the possibility of inclusion in the study. There were two offices in Wise County, one in Floyd County, and one in Lee County. Only one provider in Wise County declined to participate. He was seeing very few patients and planning to close the office and leave the area within a few months. This resulted in one office in each of the three counties being included in the study.

Data Collection Procedures

Study participants were patients that were recruited by staff members in participating chiropractic offices in each of the three counties. Eligibility for participation in the study was determined by staff in the offices as described above. Participants who met inclusion criteria were given the option to fill out the survey questionnaires (See Appendix A). The staff members in offices gave the participants a consent form to read that explained the purpose of the study and the time commitment involved (See Appendix B). Documentation of consent by the respondents was waived by the Institutional Review Board (IRB) at the University of North Carolina at Greensboro (UNCG) so that no signed consent forms were collected. Participants were then provided with the questionnaire to complete and a copy of the consent form to keep. Data collection took place in private places in the office provided by staff members. At the completion of the survey, participants were provided with a small gift that included a tea or coffee bag in a paper hand craft worth approximately $1.

Human Subjects Protection

The study was judged to be exempt by the UNCG IRB (See Appendix C). Chiropractic office staff members were trained in protection of human subjects by the student researcher. Participants were informed that participation in the study was totally voluntary, and that all information obtained in the study would be kept private and anonymous. They were given a consent form with an explanation of the study and numbers for the advising faculty and student researcher to call if there were any questions or concerns about the study. Participants were also informed that they could stop their

participation at any time during the study. They were assured that participation in the study would not in any way affect the health care services provided to them.

No consent forms signed by the participants were obtained and collected and no information regarding respondents was recorded on the questionnaires. Therefore no data identified participants in the study.

Data were stored in each of the chiropractic offices in a locked file box with a key that was provided by the student researcher. After data in file boxes were picked up from the offices they were kept in a locked location in the student researcher's office. All data files entered into the PASW system version 18 (SPSS, 2009) are maintained on a computer with password protection. The dissertation chairs and the student researcher are the only ones with access to the electronic and hard copy files. Data will be kept in a locked file for three years and then questionnaires will be shredded.

Instrumentation

The instruments for this study included a Demographic Questionnaire and a Health Care Practices Questionnaire. The measures are described below.

Demographic Questionnaire

The Demographic Questionnaire was developed by the student researcher with input from experts in survey development. Each participant's age, ethnicity, gender, education, marital status, tobacco and alcohol use was collected. Other demographic information that was collected included employment status, insurance status of respondent and family, income level, a regular source of healthcare and transportation.

Health Care Practices Questionnaire

The Health Practices Questionnaire was adapted from the I-CAM-Q as described by Quandt et al (2009). The I-CAM-Q was designed to assess use of CAM and also to be adapted for various international populations. Although this instrument has not been validated, it provided a clear format for use in the rural Appalachian population. This questionnaire assessed the two main reported health conditions for the participant within the past year and whether these conditions lasted less than 3 months, or for 3 months or more. The participant then indicated whether he or she had used chiropractic adjustment/ manipulation, massage, energy work, reflexology, and /or the conventional services/ practices counseling, and physical therapy. The participant also indicated what therapies he or she had used in the past year for wellness.

Variables

Health service use. Health Service Use was based on the Andersen Behavioral Model (Aday & Andersen, 1974; Andersen, 1995) and included two levels: CAM and conventional. The CAM variable included the healthcare services chiropractic adjustment/ manipulation, massage, reflexology, and energy therapy. The conventional healthcare services included physical therapy, and/ or counseling for mental health or emotional problems. The CAM and conventional services were described in terms of volume, that is, the number of visits within the last year.

Population characteristics. Sample characteristics for this study included the demographic characteristics of predisposing, enabling and need factors.

Predisposing factors. Predisposing factors included a) age, b) ethnicity, c) gender, d) education and e) marital status. Age was operationalized as continuous with a question asking respondents to indicate their age. Ethnicity was operationalized with nominal level questions that included a) Caucasian or White, b) African American or Black, c) Hispanic/Latino American, d) Asian American, e) Native American, f) other, or g) prefer not to answer. Gender was operationalized with a nominal level question that asked respondents to indicate their gender. Education was operationalized with an ordinal level question that included a) less than high school diploma, b) high school diploma or General Education Development test (GED), c) some college or technical school, d) technical school diploma, e) college degree, f) graduate or professional degree, or g) prefer not to answer. Marital status was operationalized with a nominal level question that included a) single, b) married, c) separated, d) divorced, or e) widowed.

Predisposing factors also included the social factors of alcohol and tobacco use. Alcohol use was operationalized with a nominal level question that inquired about use or non-use of alcoholic beverages within the last 6 months. If there was alcohol use, it was then quantified with the responses: a) every day, b) nearly every day, and c) x times per month. Cigarette smoking was operationalized with an ordinal level question that inquired whether the respondent had smoked a) every day, b) some days, or c) not at all. A second ordinal tobacco question inquired about the current use of any other tobacco products including use of chewing tobacco, dip or snuff. This was quantified with the responses a) every day, b) some days, and c) not at all. The questions on alcohol, smoking and other tobacco use had been adapted from the 2010 Behavioral Risk Factor

Surveillance System (BRFSS) Questionnaire (Centers for Disease Control and Prevention [CDC], 2009).

Enabling factors. Enabling factors included a) employment status, b) insurance status of respondent and family, c) income level, d) health insurance status, e) transportation and f) having a regular source of care. Income status was operationalized with an ordinal level question that asked respondents to rank their income into five levels that included a) less than $15,000, b) $15,000 to $24,999, c) $25,000 to $34,999, d) $35,000 - $49,999 e) greater than $50,000 per year or f) prefer not to answer. Employment status was operationalized with a nominal level question that included a) working full-time, b) working part-time, c) not working, or d) disabled. Insurance status for both the respondent and the family was operationalized with a nominal level question that included a) private insurance, b) Medicare, c) Medicaid, d) Veteran's Administration (VA), e) other, or f) uninsured. The respondent was instructed to check all that applied. Having a regular source of healthcare was operationalized with three questions.

The first question inquired about the use of a regular source of health care in the past year. Responses were operationalized with the following nominal level responses: a) private office primary care provider such as doctor, nurse practitioner, or physician's assistant, b) public clinic such as the health department, c) chiropractor, d) urgent care clinic, e) hospital emergency department, and f) I have not used any source for my regular health care. The second question inquired about barriers to seeing a regular source of health care. If the respondent had not used any health provider for a regular source of health care, they gave a reason for this with one of the following nominal level

responses: a) I don't have good or reliable transportation, b) I don't have a regular source of healthcare/ primary care provider, c) I can't afford to see one, d) I don't want to see one, and e) I don't need to see one.

The third question regarding going to a regular health care provider inquired about the reason for the visit, with the following nominal level responses: a) physical or check-up, b) to get medications, c) when I am sick or injured, d) other, please write in, and e) does not apply. Another question inquired whether the respondent had used the following therapies in the past year with the following nominal level questions: a) chiropractic manipulation, b) physical therapy, c) reflexology, d) massage therapy, e) counseling for mental health or emotional concerns or energy work/ therapy. The respondent was encouraged to check all that applied. Transportation to a health care provider was operationalized with a question that inquired as to the mode of transportation used by the respondent to access a regular source of healthcare. Nominal level responses included a) driving myself, b) having someone else drive me, and c) using public transportation (such as by bus).

Need factors. Need factors included reported health conditions and perceived health status. Respondents described the top two health conditions for which the respondent had sought health care in the last year. Health conditions were identified as acute versus chronic based on the time frame the respondent has experienced the health condition. This was a nominal level question. Conditions experienced for less than 3 months were labeled acute, while those lasting 3 months or greater were labeled chronic (Chou and Huffman, 2007; Saydah & Eberhardt, 2006). Perceived health status was

operationalized with an ordinal level question that was modeled after the 2010 BRSS (CDC, 2009). Responses included excellent, very good, good, fair, and poor with higher scores indicating better health status.

Data Analysis

Data Cleaning and Preparation

The researcher created a codebook for data input and analysis of data intoPASW system version 18 (SPSS, 2009). Questionnaires were first assessed for missing data. Health problems listed by respondents were categorized as to whether they were acute (less than 3 months duration) or chronic (greater than or equal to 3 months duration) and also whether they were traditionally "chiropractic" or "non-chiropractic". Health problems were categorized as being "chiropractic" if they included headaches, fibromyalgia or were musculoskeletal in nature, or "non-chiropractic" if other problems were reported.

Data Analysis by Research Question

Research question 1. What are the demographic characteristics of study participants who reside in rural Southwest Virginia? A frequency distribution was generated to report the frequency and percentage of sociodemographic variables.

Research question 2. What are the major health problems for which study participants see a provider of chiropractic care? A frequency distribution was generated reporting the frequency and percentage of the major health problems reported by patients who saw a provider of chiropractic manipulation. A second frequency distribution was generated to present the results as total, acute and chronic conditions. Health problems

were then categorized as being acute or chronic. A third frequency distribution reported whether the problems reported were traditionally "chiropractic" or "non-chiropractic."

Research question 3. What complementary and alternative medicine (CAM) and conventional therapies have chiropractic patients tried to treat health problems? A frequency distribution was generated that listed the frequency of patients who have used each CAM and conventional therapy. A separate frequency distribution listed the frequency and percentages of patients with each health problem who had tried each CAM and conventional therapy. A further distribution was generated that collapsed data across every health condition and the acute/chronic distinction. Those specific conditions such as headache or back pain that were reported as acute versus chronic were also analyzed and reported in table format.

Research question 4. Are there differences in patient profiles among patients with acute and chronic health problems seen at rural chiropractic practices? Data distribution was too small for statistical analysis, thus variables were recoded and cells were grouped prior to analysis. An independent *t*-test was performed on the continuous variable of age to determine differences by acute versus chronic conditions. Chi-square analyses or Fisher's Exact tests were performed on all nominal demographic variables to determine differences by acute versus chronic conditions.

Research question 5. Are there differences in patient profiles between patients with chiropractic and non-chiropractic health problems seen at rural chiropractic practices? Data distribution was too small for statistical analysis, thus variables were recoded and cells were grouped prior to analysis. An independent *t*-test was performed on

the continuous variable of age to determine differences by chiropractic versus non-chiropractic conditions. Chi-square analyses or Fisher's Exact tests were performed on all nominal demographic variables to determine differences by acute versus chronic conditions.

Summary

A non-experimental descriptive cross-sectional design was used to determine the demographic profiles, the major reported health problems and which complementary and alternative (CAM) and conventional treatments a sample of rural Southwest Virginia chiropractic patients used for these health problems. Differences in patient profiles among patient with acute and chronic problems and those with traditionally chiropractic versus non-chiropractic problems were also analyzed.

A convenience sample of rural residents of Floyd, Lee or Wise counties who were age 18 and older and had received at least one of the above treatments within the past year were recruited in chiropractic offices in the three counties.

A survey instrument developed by the student researcher with input from experts in survey development was used for data collection. The survey instrument consisted of two parts. The first was a demographic questionnaire that collected information on the participant's age, ethnicity, gender, education, marital status, tobacco and alcohol use. Other demographic information that was collected included employment status, insurance status of respondent and family, income level, received health status, and a regular source of healthcare and transportation. The second part of the questionnaire, the Health Practices Questionnaire was adapted from the I-CAM-Q as described by Quandt et al

(2009). This questionnaire assessed the two main reported health conditions for the participant within the past year and whether these conditions were acute or chronic. Also assessed were the therapies employed by the respondent in the past year for these health conditions and for wellness. The therapies included chiropractic manipulation, physical therapy, reflexology, massage therapy, counseling for mental health or emotional concerns or energy work/ therapy.

Data were analyzed by reporting the frequency and percentage of the major health problems, whether these health problems were reported as total, acute and chronic conditions and also whether they were traditionally "chiropractic" or "non-chiropractic." Descriptive statistics were used to analyze the types of CAM and conventional therapies used by respondents for their health problems. To assess differences in patient profiles between patients with acute versus chronic health problems and those with chiropractic versus non-chiropractic health problems, bivariate analysis was performed. An independent *t*-test was performed on the continuous variable of age to determine differences by both categorized of health problems. Chi-square analyses or Fisher's Exact tests were performed on all nominal demographic variables to determine differences by acute versus chronic conditions and chiropractic versus non-chiropractic conditions.

CHAPTER IV

RESULTS

Findings from the non-experimental descriptive cross-sectional study are presented in this chapter. A report of the demographic profiles, the major reported health problems and which complementary and alternative (CAM) and conventional treatments participants used for these health problems and for wellness is presented. Findings from the analysis of the research questions are also outlined. One hundred thirty-six surveys were collected from three offices over a six week period. Ten surveys were collected in Lee County and approximately 20 patients were seen yielding a 50% participation rate. One hundred eleven surveys were collected in Wise County and approximately 400 patients were seen in that time period with a 27.8% participation rate. Six of the surveys collected from Wise County residents had missing data including no problem or therapies listed, no regular source of health care or other demographic data and so were not included in the analysis. Two hundred sixty patients were seen atthe Floyd County office and fifteen surveys were collected during the six week period with 5.8% of those seen participating in the study. One hundred thirty surveys from the three counties were used in data analysis.

Sociodemographic Characteristics

This section presents a descriptive profile of sociodemographic data representing predisposing (see Table 1), enabling (see Table 2) and perceived need characteristics (see

Table 3) within the context of the Aday and Andersen model (Aday & Andersen, 1974; Andersen, 1995).

Predisposing Characteristics (Table 1)

Research question 1) What are the demographic characteristics of study participants who reside in rural Southwest Virginia? These are described in Tables 1 and 2. Participants (N = 130) were 37 men and 93 women (28% and 72% of sample, respectively) between the ages of 18 and 89 (M = 55.8, Mdn = 59, SD = 6.20), and who reported their ethnicity as predominately White (96.2%). Survey respondents lived in one of the following Virginia counties: Lee (15.4%), Wise (63.8%), Floyd (10%) and other surrounding counties (10.8%). Seventy-two percent of respondents were married. Those who attended some college or technical school comprised 35.4% of the sample with 26.9% reporting a college degree and 20.8% reporting a high school diploma or General Educational Development (GED) test.

Ninety-seven percent of respondents responded to items about their alcohol and tobacco use within the past 6 months. Those respondents who reported neither alcohol nor tobacco use constituted 63.5% of the sample, and 35.7% reported some use of alcohol. Within the group reporting use of alcohol, daily or nearly daily use was claimed by 10.8% of respondents with a mean of 1.8 drinks per month reported by the sample. Non-smokers comprised 91.3% of the sample and no use of chewing tobacco by 92.9%. Recent smoking was reported by 7.9% and use of chewing tobacco by 6.4% of the sample. Predisposing demographic data are outlined in Table 1.

Table 1

Predisposing Characteristics

Variable	*n*	*%*
Gender		
Male	37	28.5
Female	93	71.5
Age		
18 – 24	4	3.1
25 – 29	6	4.6
30 – 34	4	3.1
35 – 39	6	4.6
40 – 44	11	8.4
45 – 49	9	6.9
50 – 54	4	3.1
55 – 59	20	15.3
60 – 64	24	18.4
65 – 69	15	11.5
70 – 74	14	10.8
75 – 79	5	3.8
80 – 84	3	2.3
85 – 89	3	2.3
M = 55.8 *Mdn = 59*		
Race / ethnicity		
White	125	96.2
Native American	1	0.8
White / Native American	2	1.5
Marital status		
Single	15	11.6
Married	93	72.1
Separated	1	0.8
Divorced	11	8.5
Widowed	9	7.0
Education		
Less than high school diploma	5	3.8
High School diploma / GED	27	20.8
Some college or technical school	46	35.4
Technical school diploma	4	3.1
College degree	35	26.9
Graduate or professional degree	13	10.0

Table 1 continued

Variable	*n*	*%*
Alcohol use		
Use within 6 months	45	35.7
No use	66	52.4
Never use	14	11.1
Cigarette smoking		
Smoked every day within 6 months	7	5.5
Smoked some days	3	2.4
No smoking	116	91.3
Chewing tobacco use		
Use every day within 6 months	6	4.8
Use some days	2	1.6
No use	117	92.9

Enabling Characteristics (Table 2)

Forty one percent of respondents worked full-time; those not working (not seeking employment or retired) comprised 32.6% of the sample. Fourteen percent reported part-time employment, and 10.9% were disabled. Forty-three percent of respondents reported a family income greater than $50,000 per year. Twenty-five percent of the sample reported making less than $35,000 per year. Seventy-two respondents (55.8%) reported private insurance for his or her self and 63 (54.8%) reported private insurance for other family members. Medicare coverage was reported for 11.6% of respondents, and 9.6% of family members. Private and Medicare coverage together was reported as 19.4% for respondents and 12.2% for family members. Study participants and their family members that were reported to be uninsured comprised 4.7% and 9.6% of the sample respectively.

A Doctor of Chiropractic (DC) was cited as a regular source of health care by 55 respondents (43%) and a private medical provider such as an MD, NP or PA was cited by 47 (36.7% of the sample). Twenty-two respondents (19.2%) listed both a DC and medical provider as a regular source of healthcare. Two respondents (1.6%) reported no regular source of healthcare. One of these respondents cited inability to afford visits to a regular provider, and the other indicated no medical need for a regular source of healthcare. Reported reasons for seeking care from any source varied throughout the sample with no predominant theme. These included a physical exam or check-up which was cited by 6.7% of the sample, a check-up or obtaining medication or an episode of illness was cited by 6.1%, and a check-up or an illness was reported by 3.2% of respondents.

The ability to travel to see a healthcare provider was evaluated with a question inquiring about method of travel. Ninety-two percent of respondents drove themselves to a provider. Those that were driven by someone else comprised 6.2% of the sample and 0.8% reported the use of public transportation, such as taking the bus. Enabling characteristics are reported in Table 2.

Table 2

Enabling Characteristics

Variable	*n*	%
Employment		
Work full-time	53	41.1
Work part-time	18	14
Not working	42	32.6
Disabled	14	10.9
Income (family)		
Less than $15,000	6	4.6
$15,000 – $24,999	12	9.2
$25,000 – $34,999	15	11.5
$35,000 – $49,999	18	13.8
More than $50,000	56	43.1
Prefer not to answer	23	17.1
Insured status (self)		
Private insurance	72	55.8
Medicare	15	11.6
Medicaid	4	3.1
Veterans Administration (VA)	1	0.8
Uninsured	6	4.7
Private and Medicare	25	19.4
Medicare and Medicaid	3	3.1
Private and Medicaid	1	0.8
Medicare and VA	2	0.8
Private, Medicare and VA	2	1.6
Insured status (family)		
Private insurance	63	54.8
Medicare	11	9.6
Medicaid	3	2.6
Veterans Administration (VA)	1	0.9
Uninsured	11	9.6
Private and Medicare	14	12.2
Medicare and Medicaid	3	2.6
Private and Medicaid	2	1.7
Medicare and VA	2	1.7
Private, Medicare and VA	2	1.7

Table 2 continued

Variable	*n*	%
Regular source of healthcare		
Private source of medical care (MD, NP, PA)	47	36.7
Chiropractor (DC)	55	43
Public clinic / health department	1	0.8
Private medical care and Chiropractor	22	17.2
Public and Chiropractor	1	0.8
No regular source of healthcare	2	1.6
Reason to see a regular source of healthcare		
Physical or check-up	38	6.7
To obtain medications	2	0.4
When ill or injured	13	2.3
Physical and/or medications	12	2.1
Physical and/or when ill	18	3.2
Medications and/or when ill	3	0.5
Physical and/or medications and/or when ill	35	6.1
Transportation		
Driving myself	120	92.3
Someone else drives	8	6.2
Using public transportation	1	0.8

Need Characteristics (Table 3)

Need characteristics for this study included perceived health status, reported health conditions and the desire for wellness. The majority (83.9%) of respondents reported their health status as either "very good" (45.4%) or "good" (38.5%).

Research question 2) What are the major health problems for which study participants see a provider of chiropractic care? Respondents listed the two main reasons that they sought healthcare from any healthcare provider within the past year. Conditions were labeled "acute" if they had the problem less than three months and "chronic," for a problem lasting greater than three months. Health problems were further reported as

acute versus chronic, and analyzed as "chiropractic," "non-chiropractic," or "both." "Chiropractic" problems for the purposes of this analysis were defined as those that were musculoskeletal in nature such as back, neck, leg or hip pain with the addition of fibromyalgia and headaches. "Non-chiropractic" problems were those that did not include the previous description. These included medical problems such as diabetes, hypertension, heart disease, problems with lung, bladder, prostate, ears, pregnancy, dog bite injury and others. Analyses were conducted to determine those respondents who reported only "chiropractic" problems, "non-chiropractic" problems or both.

One hundred twenty-four respondents (95.4 %) reported one health problem and ninety-nine (76.2 %) reported two health problems. Respondents listed forty categories of health problems as their two main health concerns with the majority in terms of frequency being musculoskeletal, such as back, neck, joint, hip and leg pain, headaches and fibromyalgia. There were 27 separate problems listed for problem one and 26 for problem two. Back problems were initially listed by respondents as back, back and neck, back and leg and back and shoulder, and then collapsed into one back category. The category of depression and/ or anxiety was initially listed as depression, anxiety or the two together, and then was collapsed into the final combination category. Lung problems were initially listed as lung, pneumonia and asthma. Respondents also cited various medical problems as their two main health concerns. These included hypertension and diabetes, as well as gastrointestinal, sinus, thyroid, heart, and lung problems, depression and/ or anxiety, cancer, fatigue and others.

The ten main health problems that were reported by respondents are reported in Table 3. Back problems were reported by 55.4.8% of respondents, followed by neck pain (18.5%), joint pain (16.9%) and headaches (11.5%). Other problems reported were in order of frequency: diabetes (7.7%), hypertension (7.7%), thyroid (5.4%), gastrointestinal (5.4%), sinus (5.4%) and lung problems 4.6%).

Table 3

Perceived Need Characteristics

Variable	*n*	*%*
Perceived health status		
Excellent	8	6.2
Very good	59	45.4
Good	50	38.5
Fair	12	9.2
Poor	1	0.8
Health conditions (top ten reported)		
Back problem / pain	70	55.4
Neck problem / pain	24	18.5
Arthritis / joint problem	22	16.9
Headaches	15	11.5
Diabetes	10	7.7
Hypertension	10	7.7
Thyroid problem	7	5.4
Gastrointestinal problem	7	5.4
Sinus problem	7	5.4
Lung problem	6	4.6
Acute vs. chronic health problems		
Acute	10	8.1
Chronic	113	91.9
Chiropractic problem(s)	110	84.6
No chiropractic problems	20	15.4

Reported Treatments for Health Problems (Tables 4 and 5)

Research question 3) What complementary and alternative medicine (CAM) and conventional therapies have chiropractic patients tried to treat health problems? Treatments used by participants in this study were limited to chiropractic adjustment/ manipulation, massage, energy work and reflexology, and the conventional services/ practices of counseling, and physical therapy for reported health problems and wellness. Table 4 summarizes the treatments used by respondents for the top ten health problems reported by participants as their two main health problems. Chiropractic treatments were reportedly used for several medical conditions. In addition to those listed, chiropractic therapy was used for depression and /or anxiety, fatigue, bladder and pelvic problems.

Respondents who reported back pain or problems as their first or second main health concern within the past year comprised 55.4% of the sample. Of these, 78.3% to 85.7% reported the use of chiropractic manipulation to treat this condition. Massage was used by 30.4% to 49% of these participants and 30.4% to 38.8% used both chiropractic and massage therapy to treat this condition. Physical therapy (PT) was reported by 4.3% to 10.2%, counseling by 4.3%, energy therapy by 4.3% and reflexology by 8.7% of the sample.

Respondents who reported neck pain or problems as their first or second health concern comprised 18.5% of the sample. Of these, 66.7% to 91.7% of respondents used chiropractic therapy for treatment, with 41.7% to 58.3% using massage and chiropractic and massage therapy together. Physical therapy was used by 8.3 to 16.7% of the sample.

Joint pain or problems including arthritis were reported by 16.9% of respondents. Of these, 85.7% to 93.3% reported the use of chiropractic therapy for treatment. Massage therapy was used by 28.6% to 40% and 14.3% to 24.7% used chiropractic and massage therapy together to treat this condition. Twenty percent of respondents used PT; counseling was used by 6.7%, energy therapy by 14.3% and reflexology by 14.3% to treat joint problems.

Headaches were experienced by 11.5% of respondents. Eighty percent employed chiropractic therapy, 40% to 50% used massage therapy or massage and chiropractic therapies together to treat this condition.

Diabetes and hypertension were each reported by 7.7% of respondents as their first or second health concern within the past year. Chiropractic therapy was used by 25% to 33.3% of those with diabetes to treat the condition. Physical therapy and counseling were each reported by 16.7% of the sample. Hypertension was treated with chiropractic manipulation by 33.3% to 75% of respondents and 16.7% reported the use of counseling to treat this condition.

Thyroid, gastrointestinal, sinus and lung problems were reported by about 5% of the sample. Chiropractic manipulation, massage therapy or both therapies were used together by some respondents to treat these conditions (see Table 4).

Treatments for wellness were reported by 90.8% of respondents (see Table 5). Ninety nine percent of respondents employed chiropractic manipulation for wellness. Massage therapy was used by 40.7% to 48%, and chiropractic and massage therapy together was used by 33.9% to 40% of participants. Physical therapy was used by about

5.1% to 6% and counseling by 5.9% to 7% and energy therapy and reflexology were each employed by 2.5% to 3% of respondents.

Table 4

Top Ten Reported Health Problems and Therapies Used to Treat

	Problem n (%)		
Health problem treatment (tx)	1	2	Total (%)
Back pain / problem	49	23	72 (55.4)
Chiropractic adjustment (Ch)	42 (85.7)	18 (78.3)	
Massage therapy (MT)	24 (49)	7 (30.4)	
Ch and MT	19 (38.8)	7 (30.4)	
Physical therapy (PT)	5 (10.2)	1 (4.3)	
Ch and PT	1 (2)	-	
Counseling (Co)	1 (2)	1 (4.3)	
Ch and Co	-	1 (4.3)	
Energy therapy (ET)	-	1 (4.3)	
Ch and ET	-	1 (4.3)	
Reflexology (R)	-	2 (8.7)	
Neck pain / problem	12	12	24 (18.5)
Ch	8 (66.7)	12 (91.7)	
MT	7 (58.3)	6 (50)	
Ch and MT	7 (58.3)	5 (41.7)	
PT	1 (8.3)	2 (16.7)	
Ch and PT	1 (8.3)	-	
Joint pain / problem	7	15	22 (16.9)
Ch	6 (85.7)	14 (93.3)	
MT	2 (28.6)	6 (40)	
Ch and MT	1 (14.3)	4 (24.7)	
PT	-	3 (20)	
Co	-	1 (6.7)	
ET	1 (14.3)	-	
R	1 (14.3)	-	
Headaches	10	5	15 (11.5)
Ch	8 (80)	4 (80)	
MT	5 (50)	2 (40)	
Ch and MT	5 (50)	2 (40)	
PT	1 (10)	-	

Table 4 continued

	Problem n (%)		
Health problem treatment (tx)	1	2	Total (%)
Diabetes	6	4	10 (7.7)
Ch	2 (33.3)	1 (25)	
PT	1 (16.7)	-	
Co	1 (16.7)	-	
Hypertension	6	4	10 (7.7)
Ch	2 (33.3)	3 (75)	
Co	1 (16.7)	-	
Thyroid problem	5	2	7 (5.4)
Ch	1 (20)	1 (50)	
MT	-	1 (50)	
Ch and MT	-	1 (50)	
Gastrointestinal problem	4	3	7 (5.4)
Ch	1 (25)	1 (33.3)	
MT	1 (25)	1 (33.3)	
Ch and MT	1 (25)	1 (33.3)	
Sinus problem	1	6	7 (5.4)
Ch	-	5 (83.3)	
MT	-	3 (50)	
Ch and MT	-	2 (33.3)	
Lung problem	4	2	6 (4.6)
Ch	2 (50)	-	
MT	2 (50)	-	
Ch and MT	2 (50)	-	

Note: Chiropractic = Ch; Massage therapy = MT; Physical therapy = PT; Counseling = Co; Energy therapy = ET; Reflexology = R; n (%) = number and percentage using therapy for listed condition within sample

Table 5

Therapy Used for Wellness

Health problem treatment (tx)	n	%
Wellness		
Ch	117	99.2
MT	48	40.7
Ch and MT	40	33.9
PT	6	5.1
Ch and PT	3	2.5
Co	7	5.9
Ch and Co	5	4.2
ET	3	2.5
R	3	2.5
Total	118	100

Note: Chiropractic = Ch; Massage therapy = MT; Physical therapy = PT; Counseling = Co; Energy therapy = ET; Reflexology = R

Differences between Groups

Acute versus Chronic Health Problems

Research question 4) Are there differences in patient profiles among patients with acute and chronic health problems seen at rural chiropractic practices? Table 3 outlines numbers and percentages of patients who reported acute (8.1%) versus chronic problems (91.9%).

An independent *t*-test was performed on the continuous variable of age and health status to determine differences by acute versus chronic conditions (See Table 6). Health status was found to be significant in the analysis (p= .049). Those respondents reporting acute conditions reported significantly higher perceived health ratings as compared to those with chronic conditions. Chi-square analyses or Fisher's Exact tests were performed on all nominal demographic variables to determine differences by acute versus

chronic conditions. Requirements for chi-square analyses were not met due to some cell sizes being less than five, thus variables were recoded and cells were combined prior to analyses. None of the variables were found to have significant differences in the analyses.

Table 6

Bivariate analysis of demographic variables by acute versus chronic conditions

Demographic variable	Acute	Chronic	p-value*
Age, years			NS
Mean (SD)	56 (19.978)	55.52 (15.989)	
Health status*	2.10 (.738)	2.59 (.752)	.049
Race†			NS
White	8 (89)	110 (98.2)	
Non-White	1 (11)	2 (1.8)	
Gender†			NS
Male	3 (33.3)	31 (27.4)	
Female	7 (76.7)	82 (72.6)	
Marital status†			NS
Married	7 (76.7)	80 (71.4)	
Unmarried	3 (33.3)	32 (28.6)	
Educational level†			NS
High school or less	4 (40)	25 (22.1)	
Some college or more	6 (60)	88 (77.9)	
Income †			NS
Less than 25k	2 (.25)	15 (15.8)	
25k or greater	6 (.75)	80 (84.2)	
Work status†			NS
Working	6 (60)	61 (55.5)	
Not working	4 (40)	49 (44.5)	
Insured status †			NS
Insured	7 (87.5)	80 (95.2)	
Uninsured	1 (22.5)	4 (4.8)	

Table 6 (continued)

Demographic variable	Acute	Chronic	p-value*
Insured status: family †			NS
Insured	6 (100)	69 (87.3)	
Uninsured	0	10 (12.7)	
Regular health care provider †			NS
MD / NP/ PA	4 (40)	42 (37.8)	
DC	4 (40)	47 (42.3)	
Both MD and DC	1 (10)	20 (18)	
Other	1 (10)	2 (1.9)	
Reason to seek care			NS
Physical / medication	45 (42.5)	5 (55.6)	
Sick / medication	61 (57.5)	4 (44.4)	
Transportation †			NS
Drives self	8 (80)	105 (93.8)	
Other means	2 (20)	7 (6.2)	
Alcohol Use †			NS
Uses alcohol	3 (30)	40 (36.7)	
Does not use alcohol	7 (70)	69 (63.3)	
Smoking †			NS
Does smoke	1 (10)	9 (8.2)	
Does not smoke	9 (90)	101 (91.8)	
Chewing Tobacco Use †			NS
Does use	1 (10)	6 (5.6)	
Does not use	9 (90)	103 (94.5)	
Problem 1 †			NS
Chiropractic treatment	4 (40)	26 (23)	
Not used	6 (60)	87 (77)	
Used			
Problem 2			NS
Chiropractic treatment	4 (36.4)	26 (26)	
Not used	7 (63.6)	74 (74)	
Used			

Notes: a*t*-test for difference in means was used to compare age and health status; all other variables were compared using Chi-Square analyses and Fisher's Exact tests.

†denotes analyses that had cells less than 5 (over 20%) after grouping.

M = Means and SD = Standard deviation

*Average rating measured on a 1 – 5 scale with 1 being excellent

Chiropractic versus Non-Chiropractic Health Problems

Research question 5) Are there differences in patient profiles among patients with chiropractic versus non-chiropractic health problems seen at rural chiropractic practices? Table 3 outlines numbers and percentages of patients who had at least one reported chiropractic problem (84.6%) and those who had no chiropractic problems (15.4%).

An independent *t*-test was performed on the variables of age and health status to determine differences by chiropractic versus non-chiropractic conditions (See Table 7). Chi-square analyses or Fisher's Exact tests were performed on all nominal demographic variables to determine differences by acute versus chronic conditions. Requirements for chi-square analyses were not met due to some cell sizes being less than five, thus variables were recoded and cells were combined prior to analyses.

Work status was found to significantly (p= .036) differ by these categories of health problems. Those respondents who were not working were found to have non-chiropractic problems more often. Other variables were not found to be significant in the analyses.

Although the majority of analyses were found to be non-significant, those who reported non-chiropractic conditions such as lung problems, thyroid problems, diabetes or hypertension were found to have some differences in their demographic profiles. Those reporting non-chiropractic problems tended to be married, older, used chewing tobacco more often and perceived their health status as slightly worse as compared to those with chiropractic problems. Those with non-chiropractic or medical problems also tended to use both a conventional health care provider such as an MD, NP or PA as well as a DC

more often, the respondents as well as his or her family were insured more often and they tended to drive themselves to health care visits less often.

Table 7

Bivariate analysis of demographic characteristic by chiropractic versus non-chiropractic conditions

Demographic variable	Chiropractic	Non-Chiropractic	p-value
Age, years			NS
M(SD)	54.88 (16.396)	60.9 (14.425)	
Health status *			
M (SD)	2.35 (.988)	2.56 (.736)	NS
Race			NS
White +	108 (99.1)	17 (89.5)	
Non-White	1 (0.9)	2 (10.5)	
Gender			NS
Male	29 (26.3)	8 (40)	
Female	81 (73.6)	12 (60)	
Marital status			NS
Married	78 (71.6)	15 (83.3)	
Unmarried	31 (28.4)	5 (16.7)	
Educational level			NS
High School or less	26 (23.6)	6 (30)	
Some college or more	84 (76.4)	14 (70)	
Income +			NS
Less than 25k	15 (16.2)	3 (11.4)	
25k or greater	78 (83.8)	11(78.6)	
Work status			.036
Working	64 (59.8)	7 (35)	
Not working	43 (40.2)	13 (65)	
Insured status +			NS
Insured	77 (6.1)	15 (93.8)	
Uninsured	5 (93.9)	1 (6.2)	

Table 7 continued

Demographic variable	Chiropractic	Non-Chiropractic	p-value
Insured status: family +			NS
Insured	66 (86.8)	12 (92.3)	
Uninsured	10 (13.2)	1 (7.7)	
Regular health care provider +			NS
MD / NP/ PA	41 (38)	6 (31.6)	
DC	47 (43.5)	8 (42.1)	
Both MD and DC	17 (15.7)	5 (26.3)	
Other	3 (2.8)	0	
Reason to seek care			NS
Physical / medication	44 (43.1)	8 (42.1)	
Sick / medication	58 (56.9)	11 (57.9)	
Transportation +			NS
Drives self	103 (94.5)	17 (85)	
Other means	6 (5.5)	3 (15)	
Alcohol Use			NS
Uses alcohol	38 (36.2)	7 (35)	
Does not use alcohol	67 (63.8)	13 (65)	
Smoking +			NS
Does smoke	9 (8.5)	1 (5)	
Does not smoke	97 (91.5)	19 (95)	
Chewing Tobacco Use +			NS
Does Use	5 (4.8)	3 (15)	
Does not Use	100 (95.2)	17 (85)	

Notes: A *t*-test for difference in means was used to compare age and health status; all other variables were compared using Chi-Square and Fisher's Exact tests.

M = Means and SD = Standard deviation

*Average rating measured on a 1 – 5 scale with 1 being excellent

+ denotes analyses that had cells less than 5 (over 20%) after grouping.

Summary

Sample characteristics were evaluated and participants were found to be predominately White, married, and having some college or technical school education.

The majority of respondents did not report drinking alcohol, smoke or use chewing tobacco. Over half of the respondents worked full-time or part-time, and three quarters of the sample reported a family income greater than $35,000 per year. Almost all participants reported some type of insurance coverage for themselves and their family members, with over half of the respondents reporting private insurance coverage.

The majority of respondents also reported a regular source of health care with the greatest percentage having been seen by a DC, followed by a private medical provider. About one in five respondents visited both types of providers for their regular health care. Obtaining a physical exam or check-up, medication or being seen for an illness were reasons cited for seeking care. The vast majority of respondents drove themselves to provider visits.

The majority of respondents reported their health status as either "very good" or "good." Ninety-two percent of the sample reported that their problems were chronic and 8%that they were acute. They experienced a wide variety of health problems, with the majority being musculoskeletal, such as back, neck and joint problems. They also cited various medical problems including hypertension, diabetes, gastrointestinal, sinus, thyroid, and lung problems, hypertension depression and/ or anxiety, cancer and fatigue. Almost three quarters of the sample reported at least one chiropractic problem, 15% reported two chiropractic problems and 15% reported non-chiropractic or medical problems as their two main health issues.

The majority of the sample used chiropractic manipulation/ adjustment as their main therapy for health problems. A substantial percentage of patients used massage

therapy or chiropractic treatment and massage concurrently. The use of energy work, counseling, physical therapy and reflexology were reported by a smaller group of respondents.

Differences in demographic profiles among respondents with acute and chronic health problems and those with chiropractic versus non-chiropractic problems were evaluated. Those respondents reporting acute conditions reported significantly higher perceived health ratings as compared to those with chronic conditions. Those respondents who were not working were found to have non-chiropractic versus chiropractic problems more often.

The profile of those with non-chiropractic or medical problems was different from those with chiropractic problems although the majority of analyses did not yield significance. Those reporting non-chiropractic problems tended to be men, who were older, married, used chewing tobacco more often and had a worse perceived health status. They saw both a conventional provider and a DC more often, tended to be insured and not to drive themselves to visits as frequently.

CHAPTER V

DISCUSSION

The purpose of this study was to determine the demographic profiles, the major reported health problems and the complementary and alternative (CAM) and conventional treatments a sample of rural Southwest Virginia chiropractic patients used for these health problems and for wellness. Patient profiles were developed using a set of demographic variables representing predisposing, enabling and perceived need characteristics within the context of the Aday and Andersen model (Aday & Andersen, 1974; Andersen, 1995). A discussion of the findings and implications for practice and future research are presented. Limitations of the study are discussed and a final summary is presented.

Sociodemographic Characteristics

Participants in the study (N = 130) included were 37 men and 93 women (28% and 72% of sample, respectively) who were chiropractic patients in rural Southwest Virginia and had a mean age of 55.8 years. The preponderance of women is this study is in accord with other studies in which women have been found to have significantly a higher use of CAM **(**Barnes, Bloom, & Nahin, 2008; Brown, Barner, Bohman, and Richards, 2009; Cheung, Wyman & Halcon, 2007; Coulter & Shekelle, 2005; Fleming, Rabago, Mundt, & Fleming, 2007; Hildreth & Elman, 2007; Kannan et al., 2010; Nahin, Dahlhamer, & Stussman, 2010; Ness, Cirillo, Weir, Nisely, & Wallace, 2005; Unutzer et

al., 2000; Vallerand, Fouladbakhsh & Templin, 2004; Wolsko, Eisenberg, Davis, Ettner & Phillips, 2002; Wardle, Lui, & Adams, 2010; Zhang, Jones, Ragain, Spalding, Mannschrck, & Young, 2008).

The highest percentages of respondents in this study were in the categories of 55 to 59 (15.4%) and 60 to 64 (18.4%) years of age. This finding concurs with that of many CAM studies, in which CAM users have been found to be predominantly middle-aged or older (Bausell, Lee, & Berman, 2001; Brown et al., 2009; Cheung, et al., 2007; Coulter & Shekelle, 2005; Nahin, et al., 2010; Scheffler-Grant, Hill, Weinert, Nichols, & Ide, 2007; Unutzer et al., 2000; Vallerand, et al., 2004; Wu et al., 2007). Vallerand et al. (2004) found that rural adults with daily pain who used CAM had a mean age of 54 years as compared with 61 years for non-users of CAM. Cheung et al., 2007 found the highest level of CAM use in respondents aged 65 – 74, as opposed to those older than 75. Similarly, Scheffler-Grant et al. (2007) found the highest level of CAM use in rural Western women to be among those ages 60 – 69, as opposed to those ages 70 and older. Brown et al. (2009) found that age was a significant predictor of CAM use, with the highest level of use in the middle-aged to older (35 – 44; 45 – 54) group. Users of manipulative and body-based therapies, such as chiropractic manipulation were found to be in the 30 – 59 year age range.

Survey respondents who lived in Southwest Virginia were predominately White (96.2%). This reflects the ethnicity of the residents of Lee, Wise, and Floyd counties which has been reported to have White ethnicity rates of 94.5%, 93.2% and 96.3% respectively (U.S. Census Bureau, 2012). This also corresponds to the finding in the

majority of studies on use of CAM, that Whites as compared with other ethnic groups had the highest levels of CAM use **(**Bausell et al., 2001;Coulter & Shekelle, 2005;Fleming, et al., 2007; Kannan et al., 2010; Mikuls, Mudano, Pulley & Saag, 2003; Ness et al., 2005; Wu et al., 2007).

The majority of the study respondents were married (72.1%). This corresponds to the finding of Coulter and Shekelle (2005), who reported chiropractic patients to be predominately married. This sample was found to be more highly educated than has been reported by the U.S. Census Bureau (2012) for the study area. Although college educated residents of Lee, Wise and Floyd counties have reported rates of 11.8%, 12.7% and 19.3% respectively, study participants reported a rate of 26.9% for a college degree and 10% for a graduate degree. A higher level of educational attainment in CAM users has also been reported in other studies (Arcury, et al., 2002; Bausell et al., 2001; Brown et al., 2009; Fleming et al., 2007; Kannan et al., 2010; Ness et al., 2005; Scheffler-Grant et al., 2007; Unutzer et al., 2000; Wardle et al., 2010; Wu et al., 2007; Zhang et al., 2008). Kannan et al. (2010) found that 31% of CAM users had some college education, and 34% had a bachelor's degree or higher. Users of manipulative and body-based therapies such as chiropractic manipulation were also found to be predominantly more highly educated (Kannan et al. 2010). Hildreth and Elman (2007) found that a high school diploma or more education was predictive of CAM use.

This sample reported a low use of alcohol and tobacco. Findings regarding the use of alcohol and tobacco as a predictor of CAM have been mixed. Kannan et al. (2010) found that those who smoked less were significantly more likely to use CAM. Cheung et

al. (2007) found that CAM users were more likely to be non-smokers, and alcohol use was non-significant in the analysis. In keeping with the respondents' reports of good or very good health status, these chiropractic patients' lifestyle and health indicators seem to indicate healthy choices.

Despite the fact that almost one-quarter of residents in the study area are reported to live below the poverty level (U.S. Census, 2012), over half of respondents in the study worked full-time or part-time and three-quarters of the sample reported a family income greater than $35,000 per year. Forty-three percent of respondents reported a family income greater than $50,000 per year. Employment has been found to be a significant enabling factor for CAM use in some studies (Fleming et al., 2007; Wu et al., 2007). Fleming et al. (2007) found that adult CAM users with chronic pain were significantly more likely to be currently employed and have higher incomes as compared with non-CAM users. Wu et al. (2007), in their study of CAM use in adult women with depression, found that unemployed women were significantly less likely to use CAM compared with employed women. Generally, those who use CAM have been shown to have significantly higher income levels (Barnes et al., 2008; Del Mundo et al., 2002; Fleming et al., 2007; Kannan et al. 2010; Nahin et al. 2010; Ness et al., 2005). Similar to the findings of the current study, Del Mundo et al. (2002), found that rural primary care patients who used CAM had an annual income significantly greater than $35,000 as compared with non-CAM users. Ness et al. (2005) found that higher incomes in middle aged and older Americans were associated with more frequent use of CAM. Those in the

highest income quartile (income > $60,001 per year) were significantly more likely to use a CAM provider.

Almost all participants reported some type of insurance coverage for themselves and their family members, with over half of the respondents reporting private insurance coverage. Seventy two respondents (55.8%) reported private insurance for himself or herself, and 63 (54.8%) reported private insurance for other family members. Medicare coverage was reported for 11.6% of respondents and 9.6% of family members. Private insurance and Medicare coverage together was reported by 19.4% of respondents and 12.2% for family members. Only 4.7% of study participants and 9.6% of their family members were reportedly uninsured. Most studies have found that having health insurance is a significant enabling factor in CAM use (Barnes et al., 2008; Cherkin et al., 2002; Kannan et al., 2010; Rhee, Garg, & Hershey, 2004; Wolsko et al., 2002; Zhang et al., 2008). Barnes et al. (2008), using the 2007 NHIS dataset, found that CAM users who were younger than 65 had private health insurance, as compared with those who had public or no health insurance. Wolsko et al. (2002) found that frequent CAM use, defined as eight or more visits to a CAM provider per year, was significantly associated with full insurance that covered the CAM provider.

A Doctor of Chiropractic (DC) was cited as a regular source of health care by a significant percentage of respondents (43%) and a private medical provider such as an medical doctor (MD), nurse practitioner (NP) or physician's assistant (PA) was cited by a slightly lower percentage (36.7%) of the sample. About one fifth of respondents (19.2%) listed both a DC and medical provider as a regular source of healthcare and only 2

respondents (1.6%) reported no regular source of healthcare. Other studies (Barnes et al., 2008; Brown et al., 2009 Kannan et al., 2010) have reported that CAM users visit conventional providers more often than do non-users. The findings regarding the use of a DC as a regular source of health care also concur with those of other authors who have reported that some patients see their DC as their primary care provider (PCP) (Cambron, Cramer, & Winterstein, 2007; Cooper & McKee, 2003; Leach, 2010). Cambron et al. (2007) found that 19% of chiropractic patients viewed their DC also as a PCP, and the most frequent reason they went to the DC was for musculoskeletal complaints. In addition, the authors found that 69% of respondents agreed that DCs could treat hypertension, 65% sinusitis and 45% anxiety and depression.

The respondents in this sample did not appear to have any difficulty with transportation. The majority were able to drive themselves to office visits. This finding appears to be congruent with the sample of respondents generally having higher incomes as compared with the rest of the population.

The majority of respondents reported their health status as either "very good" (45.4%) or "good" (38.5%). Although studies reporting perceived health status in CAM users have been mixed, the findings of this study are in accord with those of Brown et al. (2009) and Kannan et al. (2010), who found that CAM users reported having better health status, as opposed to CAM non-users.

Reported problems included a wide variety of both musculoskeletal and non-musculoskeletal problems. The majority were musculoskeletal such as back, neck, joint, hip and leg pain, headaches and fibromyalgia. Respondents also cited various other

medical problems such as hypertension and diabetes, as well as gastrointestinal, sinus, thyroid, heart, and lung problems, depression and/ or anxiety, cancer and fatigue.

The majority of respondents reported chronic problems (75% - 87%), while a smaller group reported acute problems (8% - 9%). These findings support those of Saydah and Eberhardt (2006), who found that 54.5% of adults with two or more chronic conditions were CAM users, and that chronic disease significantly predicted the use of CAM. Many other studies have found a significant association between CAM use and chronic conditions (Arcury, Grzywacz, Neiberg, Nguyen et al., 2011; Cherkin et al., 2002; Hildreth and Elman, 2007; Hsiao et al., 2006; Nahin et al., 2010; Sheffler-Grant et al., 2007 &Wardle et al., 2010). Rural residents are also known to have a higher prevalence of chronic disease, including chronic pain (Hoffman, Meier, & Council, 2002), hypertension and heart disease (Arcury, Grzywacz, Neiberg, Nguyen, et al., 2011), as compared with urban residents. It is also known that there are higher reported levels of musculoskeletal problems in rural residents, including arthritis (Arcury, Grzywacz, Neiberg, Nguyen, et al., 2011; Huttlinger et al., 2004), back pain and other musculoskeletal pain (Del Mundo, et al., 2002; Hoffman, Meier, & Council, 2002; Lipscomb, Dement, Epling, McDonald, & Schoenfisch, 2007; Vallerand, et al, 2004).

Treatments for Health Problems and for Wellness

The use of treatments explored in this study were limited to chiropractic adjustment/ manipulation, massage, energy work and reflexology, and the conventional services/practices of counseling, and physical therapy for reported health problems and wellness. A majority reported the use of chiropractic manipulation to treat back, neck,

joint problems and headaches, as well as other conditions that were not reported here. Massage was used by about a third to one half of these patients and about a third of patients used both chiropractic and massage therapy to treat these conditions. Smaller numbers of respondents used physical therapy (PT), counseling, energy therapy and reflexology.

Of interest was the use of chiropractic manipulation by one-quarter to one-third of those with diabetes and hypertension to treat these conditions. Chiropractic treatment was employed by respondents with thyroid, gastrointestinal, sinus and lung problems as well. About one-quarter to one-half of respondents with these conditions used chiropractic manipulation, massage therapy, or both therapies together for treatment.

The vast majority of respondents used CAM treatments for wellness. Almost all of these used chiropractic manipulation for wellness; massage therapy was used by almost half of the sample and the two treatments together were used by one third to one half of participants. Physical therapy, counseling, energy therapy and reflexology were used by smaller numbers of respondents.

Differences between Groups

Bivariate analyses were performed to evaluate differences in patient profiles among patients with chiropractic or non-chiropractic problems and acute versus chronic health problems. Work status was found to significantly differ ($p = .036$) by chiropractic versus non-chiropractic conditions. Those respondents who were not working were found to have non-chiropractic problems more often. Those with acute conditions

reported significantly better health ratings (p = .049) as compared to those with chronic conditions.

The profile of those with non-chiropractic or medical problems was different from those with chiropractic problems although the majority of analyses did not yield significance. Those reporting non-chiropractic problems tended to be men, who were older, married, who used chewing tobacco more often and had a worse perceived health status. They saw both a conventional provider and a DC more often, tended to be insured and not to drive themselves to visits as frequently.

Limitations

Limitations of this study include a cross-sectional design with a convenience sample that was recruited by staff in chiropractic offices. Although participation rates of 27.8% and 50% in the far southwest Virginia counties of Lee and Wise were acceptable, the rate of 5.8% in Floyd County was very low. The office staff members in Floyd County office seemed to be more reluctant to offer the questionnaire. Also, the incentive of a handcraft with coffee or tea was well-received in the former two counties, but was not given to potential participants by the office staff in Floyd County after the start of the study. This was due to a philosophy that caffeinated beverages were not healthy for the patients of that office. Questionnaires were limited to those that could read and write English and data was obtained through self-report, excluding those that could not read or write English. However, most of the questionnaires were completed and it appeared that the vast majority of participants understood the questions and were willing to provide information concerning their health and health care choices.

Conclusions

The purpose of this study was to determine the demographic profiles, the major reported health problems and the complementary and alternative (CAM) and conventional treatments a sample of rural Appalachian chiropractic patients used for these health problems and for wellness. Participants (N = 130) were 37 men and 93 women who were predominately White, married, middle-aged, well-educated and lived in one Lee, Wise, Floyd or a surrounding county in Southwest Virginia. They tended to be working, insured and have an income greater than $35,000 per year. They mainly reported their health as either "very good" or "good." They reported a low rate of alcohol and tobacco use. They tended to use either a DC or a medical provider or both for a regular source of health care, with a DC being seen six percent more than a medical provider for regular health care visits. They primarily reported musculoskeletal problems but also non-musculoskeletal problems. The majority of health problems reported by respondents were chronic versus acute. Perceived health ratings were found to be significantly better in those with acute versus chronic health conditions. Those respondents who were not working were found to have non-chiropractic problems more often. Although non-significant, the profile of those who reported non-chiropractic problems differed from those with chiropractic problems. They tended to be men, who were older, married, who used chewing tobacco and had a worse perceived health status. They saw both a conventional provider and a DC more often, tended to be insured and not to drive themselves to visits as frequently. These findings make sense for those with medical conditions.

The findings presented here appear to be in accord with those of several other studies regarding the use of CAM and chiropractic care in particular. Although participants lived in an area known to be underserved and impoverished, this sample of chiropractic patients tended to have higher incomes and were generally insured. This demographic profile was more similar to those described in national inquiries regarding CAM users. However, respondents did report a majority of chronic health conditions and the use of a DC for regular health care visits. These findings concur with other research that has been conducted in rural areas and in Southwest Virginia in particular.

Chiropractic therapy, massage and the combination of those therapies were found to be utilized for musculoskeletal as well as non-musculoskeletal conditions in chiropractic patients in rural Appalachia. The majority of the sample used chiropractic manipulation/adjustment with a substantial percentage of respondents using massage therapy or the two treatments concurrently. Chiropractic manipulation was used by one-quarter to one-third of those with diabetes and hypertension to treat these conditions and was employed by respondents with thyroid, gastrointestinal, sinus and lung problems as well. About one-quarter to one-half of respondents with these conditions used chiropractic manipulation, massage therapy, or both therapies together for treatment. These findings have implications for medical clinicians who also provide care for these conditions.

There may be several explanations for the use of chiropractic treatment for conditions usually treated with medical care. Patients may find chiropractic treatment effective and/ or they may enjoy the model of care provided by a DC. Doctors of

chiropractic often spend more time with their patients and the care is often holistic, collaborative and wellness oriented. This is a model of care that is appreciated by many Americans including those in rural areas. Residents in rural areas may trust a DC more than a traditional medical provider or may find the office more convenient to access.

Implications for Future Research

It is known that residents living in rural Appalachian have a longstanding tradition of using CAM and that these residents visit DCs more often than any other CAM practitioners. In addition, those living in rural and health professional shortage areas (HPSAs), such as those in Southwest Virginia, have been reported to access high rates of chiropractic care for both musculoskeletal and non-musculoskeletal conditions, as has been indicated in this study.

This study provides new information about the use of CAM and conventional treatment among those who live in rural Appalachia. Respondents in this study were found to employ chiropractic therapy, massage therapy and both types of treatment for both musculoskeletal and non-musculoskeletal health conditions, including medical problems such as hypertension and diabetes. Research is needed to explore the health beliefs of these rural Appalachian residents regarding their health conditions and the motivations for their treatment and provider choices. Research is also needed regarding the effectiveness of CAM and conventional therapies for these conditions. Broader sampling techniques are needed to access rural residents from all sociodemographic strata. In this way, health care in this underserved region can be improved.

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APPENDIX A

STUDY QUESTIONNAIRE

Questions about you

This survey is part of a graduate student nurse research project being conducted to learn more about health services in rural communities in southwest Virginia. The survey includes questions about you, your health, and the health practices you use to keep yourself healthy. The findings of this study will be used to improve health care in your community.

Please answer all questions as best you can. There are no "right" or "wrong" answers. Thank you for your time. Put a check in the box beside your answer(s).

1. **My health is mostly (choose one)**:
   - ☐ Excellent
   - ☐ Very good
   - ☐ Good
   - ☐ Fair
   - ☐ Poor

2. **I am now (choose one)**:
   - ☐ Single
   - ☐ Married
   - ☐ Separated
   - ☐ Divorced
   - ☐ Widowed

3. **My race/ ethnic background is (choose all that apply):**
   - ☐ Caucasian/White
   - ☐ African American/ Black
   - ☐ Hispanic/ Latino American

- Asian American
- Native American
- Other, please describe: _____
- Prefer not to answer

4. **My age is _____**

5. **I am**
   - Male
   - Female

6. **My level of education is (choose one)**:
   - Less than high school diploma
   - High school diploma/ GED
   - Some college or technical school
   - Technical school diploma
   - College degree
   - Graduate or professional degree
   - Prefer not to answer

7. **My zip code is:_____**

8. **I live in the County of:**
   - Lee
   - Wise
   - Floyd

9. **My <u>family</u> income in a year is (choose one)**:
   - Less than $15,000
   - $15,000 - $24,999
   - $25,000 - $34,999
   - $35,000 - $49,999
   - More than $50,000
   - Prefer not to answer

10. I now:

- Work full-time
- Work part-time
- Am not working (not looking or retired)
- Am disabled (not able to work)

11. My own health insurance is (check all that apply):

- Private insurance
- Medicare
- Medicaid
- Veterans Administration (VA)
- Other _____
- I do not have health insurance

12. The health insurance of the <u>rest of my family</u> who either live at home or I help support is (check all that apply):

- Private insurance
- Medicare
- Medicaid
- Veterans Administration
- Other _____
- My family does not have health insurance

13. Within the past year, I have gone to this person most often for my <u>regular</u> health care (choose one):

- Private doctor (MD), nurse practitioner (NP), or physician's assistant (PA)
- Public clinic such as health department
- Chiropractor (DC)
- Urgent care clinic
- Hospital emergency department
- I have **not** used any source for my regular health care

14. If I have not gone to anyone for my regular health care, it is because (choose all that apply to you):

- I don't have good or reliable transportation
- I don't have a regular doctor or other health care provider

- ☐ I can't afford to see one
- ☐ I don't want to see one
- ☐ I don't need to see one

15. I go to a doctor or other health provider at least once a year for (check all that apply to you):

- ☐ Physical or check-up
- ☐ To get medications
- ☐ When I am sick or injured
- ☐ Other, please write in _____
- ☐ Does not apply, I don't go to a regular health care provider

16. When I see someone for my health care, I get there by (choose one):

- ☐ Driving myself
- ☐ Having someone else drive me
- ☐ Using the bus or some other public transportation

17. Which of these treatments have you used for your health problems in the past year? (check all that apply to you):

- ☐ Chiropractic manipulation
- ☐ Physical therapy
- ☐ Reflexology (a therapy that uses pressure points on the hands and feet)
- ☐ Massage therapy
- ☐ Counseling for mental health or emotional concerns
- ☐ Energy work/ therapy such as Reiki

Questions 18 through 21 are about the alcoholic drinks that you might use including beer, wine, wine coolers and hard liquor like vodka, gin, or whiskey.

18. Have you had an alcoholic beverage in the last 6 months? (choose one):

- ☐ Yes
- ☐ No
- ☐ Never drank an alcoholic beverage (If **"no" or "never drank"**, skip to question **20**).

19. If <u>yes,</u> in the last 6 months, how often did you have at least one drink? (choose one):

- ☐ Every day
- ☐ Nearly every day
- ☐ ___Times per month

20. In the past 6 months, have you smoked cigarettes every day, some days, or not at all (choose one)?

- ☐ Every day
- ☐ Some days
- ☐ Not at all

21. In the past 6 months have you used chewing tobacco, dip, or snuff every day, some days, or not at all? NOTE: All these are forms of a moist smokeless tobacco, usually sold in small pouches that are used under the lip against the gum **(choose one):**

- ☐ Every day
- ☐ Some days
- ☐ Not at all

(Please go to the next page →)

QUESTIONS ABOUT YOUR HEALTH

Please list below two main reasons that you went to see any health care provider in the past year below. *Examples of health problems are: headaches, neck pain, back pain, depression, anxiety, and joint pain.*

Health Problem #1:_____

☐ **I have had this problem less than 3 months**

☐ **I have had this problem for 3 months or more**

Health Problem #2:_____

☐ **I have had this problem less than 3 months**

☐ **I have had this problem for 3 months or more**

Please refer to these two problems throughout this survey.

The questions on the next three pages will ask what treatments you have used in the last year for your two main health problems and for wellness: chiropractic adjustment/ manipulation, physical therapy, massage, reflexology, energy therapy and counselling. Please check the different types of treatments you have used within the last year for

Problem #1. Please refer only to <u>Problem #1</u> for this page.

Health Problem #1: _____

Health problem #1 is:_____ **I have used use the treatments listed below for this problem <u>in the last 12 months</u>**					**Check if you are using this treatment or product now**
		Yes	**No**	**Number of times last 12 months**	
1.	Chiropractic manipulation	☐	☐	___	☐
2.	Physical Therapy	☐	☐	___	☐
3.	Energy work/ therapy	☐	☐	___	☐
4.	Counselling	☐	☐	___	☐
5.	Massage	☐	☐	___	☐
6.	Reflexology (a therapy that uses pressure points on the feet or hands)	☐	☐	___	☐

The next set of questions will ask you about the different types of treatments you have used for Problem #2 within the last year. Please refer only to <u>Problem #2</u> for this page.

Health problem #2 is:_____ **I have used use the treatments listed below for this problem <u>in the last 12 months</u>**					**Check if you are using this treatment or product now**
		Yes	**No**	**Number of times last 12 months**	
7.	Chiropractic manipulation	☐	☐	___	☐
8.	Physical Therapy	☐	☐	___	☐
9.	Energy work/ therapy	☐	☐	___	☐
10.	Counselling	☐	☐	___	☐
11.	Massage	☐	☐	___	☐
12.	Reflexology (a therapy that uses pressure points on the feet or hands)	☐	☐	___	☐

PLEASE GO TO **THE NEXT PAGE →**

The next set of questions will ask you about the different types of treatments you may have used to <u>improve well-being or to make you feel better overall</u> within the last year.

I have used the treatment below to help improve wellbeing or make me feel better <u>in the last 12 months</u>					**Check if you are using this treatment or product now**
		Yes	**No**	**Number of times in the last 12 months**	
13.	Chiropractic manipulation	☐	☐	___	☐
14.	Physical Therapy	☐	☐	___	☐
15.	Energy work/ therapy such as Reiki	☐	☐	___	☐
16.	Counselling	☐	☐	___	☐
17.	Massage	☐	☐	___	☐
18.	Reflexology (a therapy that uses pressure points on the feet or hands)	☐	☐	___	☐

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Thank you very much for helping us in this study!

APPENDIX B

DISSERTATION CONSENT FORM

INFORMATION ABOUT STUDY

Title of Research: Chiropractic and conventional therapy for acute and chronic health conditions among Appalachian residents

Researcher(s): Faculty: Louise Ivanov, PhD, Eileen Kohlenberg, PhD
Student researcher: Virginia (Gini) K. Weisz

This is a research project.We are asking if you would like to be included in a study about different kinds of treatments for health problems. The survey comes from a graduate nursing student at the University of North Carolina at Greensboro. You are being asked to participate in this study because you see a Doctor of Chiropractic and live in a rural area in southwest Virginia.

If you decide to be in the study, you will be asked to answer a questionnaire that will take about 20 to 30 minutes of your time. Approximately 200 people from Floyd, Lee and Wise counties in Virginia will be asked to participate in the study.

We do not expect you to experience any risk from completing the questionnaire. You may stop filling out the questionnaire at any time.

You will receive a handmade craft with a coffee or tea bag for filling out the survey and giving it to the staff person who contacted you. The benefit to you might be to become more aware of the ways you take care of yourself and your health.

You can choose not to be in this study. If you decide to be in this study, you may choose not to answer certain questions or not to be in certain parts of this study.

There are no costs to you for being in this study. It is your choice whether or not to be in this study. What you choose will not affect any care you receive from the chiropractic office.

If you decide to be in this study, what you tell us will be kept private. Your name will not be collected or linked to the questionnaire that you fill out. If we present or publish the results of this study, your name will not be linked in any way to what we present.

If at any time you want to stop being in this study, you may simply stop filling out the questionnaire and it will be destroyed.

If you have questions now about this study, ask at any time before, during or after filling out the survey.
If you have any questions later, you may talk with Gini Weisz at 540-521-7220.

If this study raised some issues that you would like to discuss with a professional, you may contact Gini Weisz at 540-521-7220 and she will help you with a referral to someone can help.

This study has been approved by the University of North Carolina Office of Research Integrity. If you have questions or concerns about your rights as a research subject or have complaints about this study, you should contactOffice of Research Integrity at UNCG toll-free at (855)-251-2351.

If all of your questions have been answered and you would like to take part in this study, please let the office staff know and he or she will give you a survey to fill out. This form is yours to keep. We will not keep a form with your name so your answers are anonymous.

Thank you for considering participating in this study. We hope that results from this study will eventually improve health care in our area.

APPENDIX C

NOTICE OF IRB EXEMPTION

To: Luba Ivanov
Community Practice Nursing
218 Moore Building

From: UNCG IRB
Date: 3/01/2013
RE: Notice of IRB Exemption

Exemption Category: This study continues to meet the following exempt category: Survey, interview, public observation
Study #: 13-0048
Study Title: Chiropractic and Conventional Therapy for Acute and Chronic Health Conditions Among Appalachian Residents

This submission has been reviewed by the above IRB and was determined to be exempt from further review according to the regulatory category cited above under 45 CFR 46.101(b).

Study Description: This project will survey residents of the Appalachian region of Virginia who are chiropractic patients.

Regulatory and other findings:
- This research meets criteria for a waiver of written (signed) consent according to 45 CFR 46.117(c)(2).
- If your study is contingent upon approval from another site, you will need to submit a modification at the time you receive that approval.

Study Specific Details: Please note that it is the Principal Investigators responsibility to keep record of human subject's research training (Student Researcher or Researcher modules) and signed statements of confidentiality on file for all research team members.

This modification, dated 2/27/13, addresses the following:
- Addition of Cloverleaf Chiropractic as a research site.
- Addition of Julia Cookson as a research assistant.

Investigator's Responsibilities: Please be aware that any changes to your protocol must be reviewed by the IRB prior to being implemented. The IRB will maintain records for this study for three years from the date of the original determination of exempt status.