Beliefs about Complementary and Alternative Medicine in HIV-infected Black Women Using the Theory of Planned Behavior

Stephanie G. Lino

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BELIEFS ABOUT COMPLEMENTARY AND ALTERNATIVE MEDICINE IN HIV-INFECTED BLACK WOMEN USING THE THEORY OF PLANNED BEHAVIOR

By

Stephanie G. Lino

A Dissertation in Partial Fulfillment of the Requirements for the Degree of Doctor of Public Health in Health Education

May 2013
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ABSTRACT OF THE DISSERTATION

Beliefs About Complementary and Alternative Medicine in HIV-Infected Black Women

Using the Theory of Planned Behavior

By

Stephanie G. Lino

Doctor of Public Health Candidate in Health Education

Loma Linda University, Loma Linda, California, 2013

Susanne Montgomery, PhD, MPH, Chair

Background. Black women make up 12% of the female population in the U.S, yet they account for 66% of new HIV infections. In 2002, AIDS was the most cited reason for death among Black women age 25-34. While prevention remains, a major effort targeting treatment efficacy and modalities for this sub-group need to be better understood.

Purpose. The purpose of this study is to assess whether HIV-positive Black women's attitudes, subjective norms and perceived behavioral control are related to intention of dietary supplements and spiritual practices use in their HIV treatment.

Method. In phase one, Grounded Theory methods (N= 29) were used to explore salient beliefs surrounding complementary and alternative medicine (CAM) use for treatment of HIV. Based on this qualitative exploration guided by the Theory of Planned Behavior (TPB), we developed and administered a questionnaire to 153 HIV-positive Black women. HIV medication adherence was also assessed among the respondents.
Results. Respondents engaged in CAM behavior to improve their immune function. Respondents also engaged in CAM because it provided a sense of control in their HIV treatment. Forty-five percent of respondents used dietary supplements, while 70% used spiritual practices to treat their HIV. Attitudes, subjective norms, and perceived behavioral control were found to be significant predictors of intention for dietary supplement use, as part of HIV care. Attitudes and perceived behavioral control were found to be significant independent predictors, explaining 70% ($p < .0001$) of the variance. For intention to engage in spiritual practices, attitudes, subjective norms, and perceived behavioral control were found to be significant independent predictors explaining 77% ($p < .0001$) of the variance. For HIV medication adherence, there was no significant difference in adherence between those who were users and non-users of dietary supplements or spiritual practices.

Conclusions. The results of this study show that attitudes and perceived behavioral control are the most important predictors of intention to use dietary supplements for treatment of HIV among Black women, while for spiritual practices, all TPB variables are significant predictors of intention. Notably, using dietary supplements or spiritual practices as part of their care did not affect the women’s medication adherence.
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CHAPTER 1 - INTRODUCTION

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CHAPTER 1
INTRODUCTION

A. Statement of the Problem

African Americans are affected by new infections with the Human Immunodeficiency Virus (HIV)/Acquired Immune Deficiency Syndrome (AIDS) at an alarming rate. HIV infection remains a substantial problem for minority women, particularly among African American women. In 2005, African American females accounted for 66% of all women diagnosed with HIV (CDC, 2007). By the end of 2008, HIV was the third leading cause of death among African American women ages 35-44 in the United States. In 2009, Black women accounted for 30% of the estimated new HIV infections among all Blacks (CDC, 2011a).

While prevention remains, a major effort targeting African Americans treatment efficacy and modalities for this sub-group need also to be better understood. Current HIV medication, which is referred to as highly active antiretroviral therapy (HAART) is a combination of HIV pills used to treat HIV. This antiretroviral therapy does not cure HIV, but it can lower the level of HIV in the body and prevent destruction of the immune system. To slow the progression of HIV to AIDS, a critical component of effective antiretroviral treatments is patient adherence (Merenstein et al., 2009). Death rates for HIV-infected people have dramatically decreased since the release of HAART in 1996 (Bhaskaran et al., 2008) with a 44% drop in deaths for the United States (Cheever, 1999).

In addition to HAART, many infected persons look into different or additional methods to help them deal with HIV infection and/or the side effects of HAART itself.
Patients who suffer from chronic illnesses (such as cancer or HIV) turn to alternative medicine because of a desire to become involved with their healthcare decisions and also because of dissatisfaction with conventional medications (Astin, 1998; Barnes, Powell-Griner, McFann, & Nahin, 2004). Generally speaking, complementary and alternative medicine (CAM) is defined as a broad range of healing therapies and products (e.g. nutritional supplements, herbal remedies, acupuncture, meditation, prayer) that are currently not integrated with conventional medicine and are not widely taught in Western medical schools (Barnett et al., 2003; Eisenberg et al., 1993). One national study reported that CAM use for the general population in the U.S. (between 1991 and 1997) increased from 33% to 42% (Eisenberg et al., 1998). Historically, African Americans were often isolated from every rudimentary medical care and therefore developed their own self-healing traditions using accessible herbs, food stuff and other substances (Barnett et al., 2003). Thus it is not surprising that CAM use in African Americans was found to be around 67.6% (Brown, Barner, Richards, & Bohman, 2007). Hipps et al. (2009) found that 26% of African Americans had used some type of complementary or alternative medicine for personal health care.

The use of complementary and alternative medicine (CAM) among HIV/AIDS infected individuals has gained increasing popularity, with utilization rates estimated between 30-80% (Duggan, Peterson, Schutz, Khuder, & Charkraborty, 2001; Knippels & Weiss, 2000; Mikhail et al., 2004). Risa and associates (2002) found that among HIV-infected individuals, new users of alternative therapies were significantly more likely to be African American. There is still much debate in the literature about whether the use of CAM enhances or diminishes HIV medication adherence among HIV infected
individuals, particularly African Americans. A study by Parsons, Cruise, Davenport, and Jones (2006) looked at whether religious practices (church attendance, bible study and prayer) had a significant relationship to HIV medication adherence. The authors found that indeed, religious practices had a positive influence on HIV medication adherence.

Another study by Owen-Smith, Diclemente, and Wingood (2007) found that women using CAM (specifically the natural immunity boosters and vitamins) were 1.69 times more likely \((p = 0.41)\) to report non-adherence to their HAART medication.

A person's attitude towards performing a behavior is an important factor that will determine whether or not a person will be engaged in that particular behavior. For example using HIV medication adherence, Schrimshaw, Siegel, and Lekas (2005) found that African American women held negative attitudes towards HIV medication and were less likely to perceive benefits of medication adherence to HAART, compared to White and Puerto Rican women. Research shows that the relief of side effects and the increase in quality of life are factors that promote positive attitudes of CAM use among certain populations of HIV-infected individuals (Chang, van Servellen, & Lombardi, 2003; Hsiao et al., 2003). To date, there are very few studies in the literature about attitudes and behavioral intention of CAM usage among HIV-infected Black women. The theory of planned behavior was used to explore the attitudes and beliefs of HIV positive Black women and their intention to use dietary supplements and spiritual practices to treat their HIV.

For the purposes of this study, the term Black will include American born and foreign born Blacks; and we will use the terms Black and African American interchangeably as cited by the different authors.
B. Purpose of the Study

The primary purpose of this study was to explore how the theory of planned behavior (TPB) variables: attitudes, subjective norms and perceived behavioral control were associated with intention of dietary supplements use and spiritual practices use for treatment of HIV in Black women. In addition, HIV medication adherence was assessed among those who were users and non-users of dietary supplements and spiritual practices. Additionally, a series of bivariate analysis were conducted to determine whether there was an association between actual dietary supplements/spiritual practices use and various demographic variables.

C. Research Questions

Qualitative Questions:

Among Black HIV-positive women in California:

- What are their behavioral beliefs, normative beliefs, and control beliefs (TPB constructs) regarding CAM use?

Quantitative Questions:

Among Black HIV-positive women in California:

- How are the constructs of the TPB (attitudes, subjective norms, and perceived behavioral control) related to intention of dietary supplements use and spiritual practices use?
- Is actual dietary supplements use associated with being adherent to traditional antiretroviral HIV medications?
- What contextual variables (including demographics) are related to actual dietary supplements and spiritual practices use?
D. Theoretical Framework

The theory of planned behavior has been used to investigate a wide range of health-related behaviors (Conner, Kirk, Cade, & Barnett, 2001; Jemmott & Jemmott, 1991; Kassem, Lee, Modeste & Johnston, 2003; Pawlak et al., 2008; Rah, Hasler, Painter, & Chapman-Novakofski, 2004; Spink, Wilson, & Bostick, 2012; Wambach, 1998). This theory states that intentions toward a behavior are influenced by attitudes toward the behavior, subjective norms and perceived behavioral control of the behavior (Conner et al., 2001). Attitudes, subjective norms and perceived behavioral control are hypothesized to work together to determine intentions to act toward a behavior. Ajzen (1991) states that “the more favorable the attitude and subjective norm with respect to a behavior, and the greater the perceived behavioral control, the stronger should be an individual’s intention to perform the behavior” (p. 188).

1. Theoretical Constructs

a. Intentions. Intention is a proximal measure of behavior. It is the “motivation” to perform a behavior. Conner et al. (2001) found that intentions of dietary supplements use was strongly predicted by positive attitudes, subjective norms and perceived behavioral control.

In a study that looked at the theory of planned behavior and alternative medicine use, Furham and Lovett (2001) found that stronger intentions of homeopathy were associated with more positive attitudes, more perceived pressure, and increased control over the use of homeopathy. To date, there are no published studies that apply the theory of planned behavior as a tool to investigate CAM use for treatment of HIV in Black women.
b. Attitudes towards CAM. Attitudes represent positive and/or negative beliefs about a certain behavior. George, Birck, Hufford, Jemmott, and Weaver (2006) found that factors such as wanting a natural approach to medicine, obtaining symptom relief, and offering hope for a cure, promoted positive attitudes toward CAM use for the treatment of asthma in African Americans. Chen et al. (2009) found that some of their HIV participants held positive attitudes towards CAM because of their positive experiences with the alternative medicine.

c. Subjective Norms and CAM. There are two types of subjective norms that are relevant to social norms. The first subjective norm is descriptive norms and the second is injunctive norms. Descriptive norms involve the perceptions of how other people are behaving, whether or not these behaviors are approved of. Injunctive norms refer to a person’s perception of which behaviors in a community are typically approved or disapproved. A study by Kaufman and Gregory (2007) found that CAM use was associated with agreement from a person’s social network.

d. Perceived Behavioral Control and CAM. Perceived behavioral control is most compatible with Bandura’s concept of self-efficacy (Ajzen, 1991). Perceived behavioral control refers to a person’s perception of the ease or difficulty of performing the behavior of interest. Studies have shown that those who use CAM do so because it makes them feel as though they are in control of their treatment (Foote-Ardah, 2003; Furham & Forey, 1994; Furham & Lovett, 2001).

e. Behavioral Beliefs and CAM. Kaufman and Gregory (2007) state that it is “possible that exposure to and choosing to use CAM might modify an individual's attitudes and health habits” (p.599). Furnham and Forey (1994) found that the
participants who consulted with an alternative medicine practitioner had a naturally stronger belief in the efficacy of alternative medicine. High behavioral beliefs can influence attitudes about deciding to use CAM and or produce negative attitudes toward using conventional medication treatments.

\textit{f. Normative Beliefs and CAM}. Normative beliefs are concerned with the likelihood that important individuals in a person’s life may approve or disapprove of a certain behavior. Chao and colleagues (2006) found that for minority women (Mexican, African and Chinese American women), CAM use by family members influenced their reason to use CAM. Another study found that HIV participants who were users of CAM stated that people close to them had recommended alternative practitioners to them (Kaufman & Gregory, 2007).

\textit{g. Control Beliefs and CAM}. Control beliefs are the perceived presence of factors that facilitate or impede a certain behavior. According to Ajzen (1991), “These control beliefs may be based in part on past experience with the behavior, but they will usually also be influenced by second-hand information about the behavior, by the experiences of acquaintances and friends, and by other factors that increase or reduce the perceived difficulty of performing the behavior in question.” Furnham and Forey (1994) found that those participants who consulted with an alternative medicine practitioner tended to know someone who had effective treatment from an alternative medicine practitioner. Kelner and Wellman (1997) found that social relations play an important role in providing information to patients seeking alternative therapy. Sixty-two percent of this study’s participants found an alternative practitioner through someone in their social network.
Figure 1.1 below depicts the theoretical framework on how the concepts of attitudes, subjective norms, perceived behavioral control and their underlying beliefs are associated with intention to use complementary and alternative medicine (CAM). Therefore, high positive attitudes toward a behavior, greater supportive support and strong perceived control of behavior can influence a person’s intentions toward engaging CAM use.

**Phase I**
- Behavioral Beliefs (Outcomes beliefs of CAM)
- Normative Belief (Family, friends beliefs about CAM)
- Control Beliefs (Perceived factors that may facilitate or impede CAM use)

**Phase II**
- Attitude toward CAM Use (Positive or negative)
- Subjective Norm (Perceived social pressure about CAM)
- Perceived Behavioral Control (Perceptions about ability to perform CAM behavior)
- Behavior Intention (Intention to use CAM)
- Behavior: CAM USE

**Figure 1.1** Conceptual Framework based on the Theory of Planned Behavior (Ajzen, 1985). This figure hypothesizes that intention to use CAM is predicted by a person’s attitudes (whether positive or negative), perceived social pressure about CAM, as well a person’s perceived control over use.

**E. Significance to Health Education**

Health educators are a part of the teams that are on the front lines of HIV prevention and treatment. Healthy People 2020’s goal relating to HIV is to reduce deaths
from HIV infection. Gaining a better understanding of CAM use among those currently receiving HIV treatment is important to promoting a more open communication between patient and healthcare provider. By creating a more open environment about HIV treatment options, the nation can get close to reaching the Healthy People 2020 goals and objectives. According to a study conducted by Hsiao et al. (2003), one-third of HIV patients surveyed were using CAM but did not disclose their use to their health care provider. Liu et al. (2009) found that only 36% of participants disclosed CAM use to their healthcare providers. We know that CAM use occurs, so at a minimum it is important to openly have patients discuss this with their HIV care providers.

There is still a lack of clarity in the literature about whether or not CAM use has an effect on HIV medication adherence. Owen-Smith et al. (2007) found that women using CAM were 1.69 times more likely to be nonadherent to their HIV medication, while others have found that CAM use was associated with higher HIV medication adherence (Knippels & Weiss, 2000; Risa et al., 2002; Wutoh et al., 2001). The studies that found an association between CAM use and adherence to HIV medication had a different methodology to assess adherence. These studies assessed whether a patient missed any HIV medication in the last 7 days; while studies that found nonadherence assessed adherence by asking patients if they missed any HIV medication in the last 30 days. Further study is needed to explore whether CAM use is associated with adherence to HIV medication because not adhering to medications can affect overall HIV care and treatment. If adherence is better with CAM, the health educator (if the care provider has no safety concerns) could for instance consider certain types of CAM to be incorporated with current HIV medication to increase adherence. If it is negatively associated with
adherence, an open conversation about this is warranted, as it may undermine the patient’s treatment plan. This study will allow us to explore HIV positive Black women’s attitudes and beliefs about CAM use, what factors are associated CAM use, and whether CAM use enhances or distracts from HAART medication adherence. Either finding might, in the long run help decrease the HIV/AIDS mortality in Black women.
CHAPTER 2
LITERATURE REVIEW

A. Overview

At the end of 2006, an estimated 1,106,400 persons in the U.S. were living with the Human Immunodeficiency Virus (HIV) (CDC, 2008). Since the beginning of the Acquired Immune Deficiency Syndrome (AIDS) epidemic in 1984, the U.S had an estimated 170,000 women who received an AIDS diagnosis. From these women, 81,900 have died from AIDS related-illnesses (McDavid, Li, & Lee, 2006). HIV takes a disproportionate toll on communities of color, with the most severe impact among African Americans. Additionally, poor and minority women have been disproportionately affected by the disease (Kaplan, Marks, & Mertens, 1997). African American women make up only 12% of the female population in the United States, yet they account for 66% of new HIV infections (CDC, 2007). In 2002, AIDS was the most cited reason for death among African American women age 25-34 years old (Anderson & Smith, 2005); their diagnosis rate was 15 times the rate of White women (CDC, 2010b).

Complementary and alternative medicine (CAM) refers to a group of therapies and products (e.g. nutritional supplements, herbal remedies, acupuncture, meditation, etc.) that are not currently considered a part of Western medical training (Eisenberg et al., 1993; Littlewood & Vanable, 2008). The use of CAM among HIV/AIDS infected populations has gained increasing popularity, with utilization rates as high as 71% (Duggan, Peterson, Schutz, Khuder, & Charkraborty, 2001; Knippels & Weiss, 2000). Risa et al. (2002) found that in HIV-infected individuals, 60% of new users of alternative therapies were significantly more likely to be African American. According to Barner,
Bohman, Brown and Richards (2010), research on the use on CAM for treatments by African Americans is scarce. One objective for this literature review is to summarize the relevant studies about type and frequency of CAM use in the general population. I then would like to discuss the relevant studies for CAM use and frequency among HIV-infected populations, particularly among African American women. This is important because identifying patterns of CAM within a specific population provides the foundation for interventions or clinical trials to test effectiveness of selected treatments (Barnett et al., 2003). The last objective of this review is to explore the attitudes, beliefs, and intentions regarding HIV-infected Black women and CAM usage.

**B. Search Methods for Identification of Studies**

The following databases were used to identify possible studies on CAM usage: Pubmed, PsychInfo, Google Scholar, Ebscohost, Web of Science and the National Center for Complementary and Alternative Medicine website. Keywords such as “complementary and alternative medicine”, “alternative medicine”, “African Americans”, “medical adherence”, “HIV/AIDS”, “HAART”, and “compliance” were used in combination to identify all possible reviews. Mesh terms such as “Human Immunodeficiency Syndrome”, “highly active antiretroviral therapy” and “drug compliance”, were also used to identify relevant studies. Cross-referencing or “snowballing” was also used to locate relevant studies for this review.

**C. HIV/AIDS in the US: Black/African Americans**

African Americans are affected excessively by Human Immunodeficiency Virus (HIV)/Acquired Immune Deficiency Syndrome (AIDS) with new infections occurring at an alarming rate. According to the Centers for Disease Control and Prevention (CDC) in
2005, African Americans in the U.S. accounted for 49% of the estimated 37,331 new HIV/AIDS cases (CDC, 2008). African American males aged 13 and older accounted for 42% of the HIV infections out of all HIV infected men in 2005 (CDC, 2008). In that same year, African American females accounted for 66% of all women diagnosed with HIV (CDC, 2008). In 2006, Black men accounted for two-thirds of new infections (65%) among all Blacks (CDC 2010a). At the end of 2007, African Americans accounted for 46% of persons living with HIV in the United States (CDC, 2010a).

HIV infection remains a substantial problem for women (Hader, Smith, Moore, & Holmberg, 2001). Women account for 1 in 4 new HIV cases and among new infections in women and 2 out of 3 are African Americans. In 2005, of the 126,964 women living with HIV/AIDS, 64% were Black (CDC, 2005). To date, over 230,000 African Americans have died of AIDS. African Americans are more likely to develop full-blown AIDS, and are more likely to die from complications of AIDS (CDC, 2011a). The rate of AIDS diagnoses for African American women was nearly 23 times the rate for White women. Recently, the CDC reported that one out of every thirty-two African American women is at risk for acquiring HIV/AIDS in their lifetime (CDC, 2010b). However, despite these alarming statistics, local state and federal efforts to attack this crisis have been unsuccessful at decreasing these persistently high rates of infection (CDC, 2008).

**D. Current Traditional HIV Treatment**

The highly active antiretroviral therapy (HAART) refers to the combination of HIV medications currently used to treat HIV. This antiretroviral therapy does not cure HIV, but it can lower the level of HIV viral load in the body and prevent destruction of
the immune system. For this medication to work effectively, patients must adhere to prescribed regimens (Rintamaki, Davis, Skripkauskas, Bennett, & Wolf, 2006). If they miss prescribed doses of the medication (nonadherence), viral resistance may develop, making the treatment ineffective (Rintamaki et al., 2006). According to a longitudinal study by British researchers, death rates for HIV-infected people have dramatically decreased since the release of HAART in 1996 (Bhaskaran et al., 2008). The authors note that the excess mortality rate of AIDS decreased from 40.8 per 1,000 person-years before the introduction of HAART (before 1996) to 6.1 per 1,000 person-years in the 2004 to 2006 period. Since the introduction of HAART, deaths from AIDS have dropped 44% in the United States (Cheever, 1999).

Although the studies mentioned above have shown that adhering to the HAART medication regimen slows the progression of HIV to AIDS, not all racial groups share the same success with HAART treatment. Researchers have shown that African American patients who are HIV positive appear to take longer than White patients to begin antiretroviral medications and also have problems with adherence. In a study involving participants from the New Jersey Medicaid Program, Crystal, Sambamoorthi, Moynihan, and McSpiritt (2001) found that African Americans experienced eight months of delay in the initiation of HIV medication therapy compared to Whites. The authors also found that Blacks used these therapies 64% of the time after the first prescription, compared to 72% for Whites. Singh et al. (1996) found that being Black was significantly associated with being nonadherent to HIV medication. The nonadherence by African Americans is one of the factors contributing to the ethnic disparity in AIDS mortality.
E. Complementary and Alternative Medicine

Complementary and alternative medicine (CAM) is defined as medical interventions, products, therapies and practices that are not widely taught at U.S. medical schools or not generally available at U.S. hospitals (Barnes, Powell-Griner, McFann, & Nahin, 2004; Eisenberg et al., 1993). The U.S. National Center for Complementary and Alternative Medicine (NCCAM) is the leading research agency of complementary and alternative medicine. This agency has divided CAM therapies to include, but are not limited to the following: acupuncture, Ayurveda, chiropractic care, chelation therapy, deep-breathing exercises, diet-based therapies, energy healing therapy, folk medicine, guided imagery, herbs, vitamins, homeopathic treatment, hypnosis, massage, progressive relaxation, Qi gong, Reiki, Tai’ chi, yoga, natural products, and naturopathy. According to Barner et al. (2010), the most common CAM therapies used for health reasons can also include prayer, herbs, and relaxation. A national study by Eisenberg et al. (1993) showed that one in three people in the U.S. used at least one unconventional therapy in 1990. The authors’ follow-up study in 1998 reported that CAM use in the United States between the years 1991 and 1997 increased from 33% to 42% (Eisenberg et al., 1998). The authors also reported that expenditures from services provided by CAM providers increased from $22.6 billion in 1990 to $32.7 billion in 1997. Rates of CAM use continued to increase in the U.S. by the year 2002. Barnes et al. (2004) found that in 2002, 62% of U.S. adults used some formed of CAM in the past 12 months.

1. CAM Characteristics

a. Chronic Illnesses and CAM. Individuals with various chronic illnesses use CAM for treatment and preventive purposes. Patients with illnesses such as cancer,
arthritis, neurologic degenerative disorders, and a host of other chronic illnesses have turned to unorthodox medical remedies as a complement or a substitute to traditional medical therapy. Two studies found that the frequency of unconventional therapy was highest for back problems, colds, headaches, anxiety, and chronic joint pain (Eisenberg et al., 1993; Barnes et al., 2004). Other studies found that CAM usage was prevalent among head and neck cancer patients (Lim, Ng, & Loh, 2010). CAM use was also found to be common among other type of cancers such as breast, colon and prostate cancer (Molassiotis et al., 2005; Wanchi, Armer, & Stewart, 2010). Among certain muscular diseases, CAM was found to be common with Parkinson’s disease and multiple sclerosis patients (Lokk & Nilsson, 2010; Schwarz, Knorr, Geiger, & Flachenecker, 2008).

b. CAM Use among Women. The literature shows that there are gender differences among those who use CAM. Women were more likely to use CAM than men (Barnes et al., 2004; Kelly, Kaufman, Kelley, Rosenberg & Mitchell, 2006; Upchurch & Chyu, 2005) and were more frequent users of the mind-body approaches (Upchurch & Chyu, 2005) which included biofeedback, meditation, guided imagery, progressive relaxations, deep breathing exercise, hypnosis, yoga, Tai chi, Qi gog, prayer and energy healing therapy. Frequency of CAM use varied among women from different ethnic backgrounds and socioeconomic status. Kronenberg, Cushman, Wade, Kalmuss, and Chao (2006) found the highest rates of CAM use among non-Hispanic White women (52%) and less use among Mexican American women (36%). Sixty-seven percent of African American women in this study reported engaging in spiritual activity and religious practices more than any other ethnic group. Upchurch and Chyu (2005) found that Asian women were more likely to use CAM that includes megavitamin therapy and
prayer than White or Black women. Hsiao et al. (2006) found that nearly half of the Asian Americans in their study used green tea and soy product and one-sixth used acupuncture. Kelly et al. (2006) found that African Americans had the lowest prevalence of herbal/natural supplement use.

Upchurch and Chyu (2005) found that women who were college graduates and who had a higher income were more likely to use CAM as were women who had health insurance. Kelly et al. (2006) found that younger women were less likely to use CAM than older women.

**F. Blacks and CAM**

Even though there has been an increase of minority populations in the U.S. over the last 20 years, there is still a gap in the current literature on CAM use by adults of nonwhite racial and ethnic backgrounds (Graham et al., 2005). Historically, African Americans were often isolated from every rudimentary medical care and therefore developed their own self-healing traditions using accessible herbs and other food substances (Barnett et al., 2003). African Americans are known to have cultural practices and traditions that they have retained from the indigenous West African cultures (Bailey, 2004). The medical influences that were brought from West Africa (during the Slave Trade) remained a part of the enslaved Africans' cultural and medical tradition (Fontenot, 1994). Even though early enslaved Africans were forced to seek medical treatment from White doctors, they still maintained their own African beliefs and practices and continued to use services of the local enslaved “secret doctors”. Fontenot (1994) stated that “These secret doctors hid their knowledge about their medicine (which included different types herbal mixtures) and carried out healing rituals behind closed doors” (p. 30). The way
Black Americans secretly cared for themselves because of the discrimination they faced during slavery, effecting how this population cared for themselves in the present day. Shippee, Schafer, and Ferraro (2012) found that discrimination among Black Americans in healthcare was associated with higher likelihood of using CAM. From slavery to present day, many of these alternative medicine practices have been passed down from generation to generation and still can be seen today in the African American culture.

CAM use in African Americans is distinct from other ethnic groups and as a result they have their own definition of CAM. African Americans are more likely to use prayer, herbal and home remedies for health treatment and preventive purposes. Bailey (2004) has defined African American CAM as “believing in and/or using ‘natural’ and/or ‘supernatural’ treatment therapies that will significantly contribute to the healing process within a holistic, familial, and a socioeconomic setting” (p.148). According to Barner et al. (2010) research on the use on CAM for treatments by African Americans is scarce. Similarly to the general population, CAM among African Americans have been used to treat a variety of illnesses such as asthma, breast cancer, diabetes, arthritis, depression and prostate cancer (Bazargan et al., 2008; Bright-Gbebry et al., 2011; Brown, Barner, Richards, & Bohman, 2007; George et al., 2006; Hipps et al., 2009; Jones et al, 2006; Jones et al., 2007; Ryder, Wolpert, Orwig, Carter-Pokras, & Black, 2008).

Brown et al. (2007) found that 67.6% percent of African Americans used CAM in the last 12 months (when prayer was included as part of the CAM modality). The results found in this study contradict other studies that state that 31% of African Americans use CAM compared to other ethnic groups (Astin, 1998; Eisenberg, et al, 1993). However, when prayer was removed from the inclusion criteria, there were only 27% of African
Americans who were found to be CAM users. A study by Hipps et al. (2009) also showed similar results that 26% of African Americans had used some type of complementary or alternative medicine for personal health care. Brown et al. (2007) found that African American CAM users were likely to be female, have a college education and have insurance coverage. These findings were validated by Brown, Barner, Bohman, and Richards (2009) who found that African American CAM users were middle-aged to older, had higher education and were female. Conversely, three studies found that African American with lower income and education were more likely to use herbal products and home remedies as their CAM modality (Barner et al., 2009, Boyd et al., 2000; Yoon et al., 2004)

G. Type of CAM Among Blacks

Brown et al. (2007) found that among those participants who have ever used CAM, prayer was used by 68.3% of African Americans, and herbals and relaxation were used 19.6% and 17.0% respectively. However, for those participants who used CAM in the past 12 months, the use of prayer dropped to 60.7%, and herbals and relaxation decreased to 14.2% and 13.6% respectively.

1. CAM Modalities Among Blacks

a. Blacks and Prayer. The use of prayer for treatment of illnesses has considered a CAM modality, despite some opposition. Tippens, Marsman, and Zwickey (2009) argue that all who pray are not CAM users and should not be treated as such. The authors also argue that when prayer is added as a CAM modality, the estimate of CAM use is inflated and the numbers are “padded” thus not accurately reflecting what is trying to be measured. Although not everyone is in agreement on the use of prayer as CAM, it
is defined by the National Center for Complementary and Alternative Medicine as a CAM modality and is included apart of CAM in various studies.

Research shows that prayer is more likely to be considered a daily activity among African Americans. Taylor, Chatters, and Levin (2004) state that close to 80% of Black Americans reported that they pray nearly every day. Graham et al. (2005) also found that prayer was the most commonly used CAM modality among 44% of African Americans. There are gender differences that exist in African Americans when it comes to religion and spirituality activities. Martin (1984) found that Black females attended significantly more church services when compared to Black men, White men and White women. This finding is consistent with extensive evidence that women are more religious than men in the general population (Sherkat & Ellison 1999 as cited in Ellison, Hummer, Cormier, & Rogers, 2000) and among African Americans (Levin, Taylor, & Chatters, 1994 as cited in Ellison et al., 2000). In regards to gender and prayer activities, the National Survey of Black Americans showed that 84% of Black women pray nearly every day compared to only 68% of Black men (Taylor et al., 2004).

Gillum and Griffith (2010) found that African Americans were more than twice as likely than White Americans and Hispanic Americans to report using prayer for health reasons. African Americans were also more likely to report being prayed for by others than White Americans. Religion studies have consistently indicated that African Americans use religion to cope with certain illness. Jones et al. (2007) found that all of their African American participants used prayer as a coping mechanism during their treatment for prostate cancer. A study by Ibrahim, Siminoff, Burant, and Kwoh (2001) found that African American patients were more likely than White patients to believe that
prayer was helpful in the treatment of osteoarthritis. Cotton, Luberto, Yi and Tsevat (2011) found that African American adolescents were more likely to use prayer for symptom management of their asthma. In terms of future use of prayer, the authors also found that the African American adolescents were seven times more likely than non-African Americans to use prayer for future symptom management of their asthma. In a qualitative study by Henderson, Gore, Davis, and Condon (2003), African American women were found to use prayer as a coping strategy for their breast cancer.

b. African American and Herbal Use. Yoon, Horne, and Adams (2004) conducted a study which found that approximately one-third of older African American women used some type of herbal preparation for their health. Those who used the herbal products reported to perceive their health to be better after the use than the group not using herbal products. In another study, participants over the age of 60 had used home remedies for minor illnesses such as colds, cuts and burns (Barnett et al., 2003). A national study by Boyd, Taylor, Shimp, and Semler (2000) found that 34% African American participants who were sampled reported that they used some type of home remedy. Of the remedy used, 68.2% were herbal preparations. Jones et al. (2006) found that herbal supplements were one commonly used form of CAM among African Americans who were diabetic. Another herbal study that looked at a Breathe Easy herbal tea was conducted in participants with chronic rhinosinusitis (Hipps et al., 2009). The authors of this study showed that a 6-week intervention reduced sinus symptoms such as headache/facial pain and nasal congestion after drinking the Breathe easy herbal tea. Additionally, participants who drank the herbal tea reported improved ability to fall/remain asleep over the course of the study. The findings from the studies mentioned
above contradict the findings in Kelly et al. (2006). Kelly et al. (2006) found that herbal mixtures were less prevalent among African Americans. Authors found that only 11% of African Americans used herbal mixtures.

In summary, the literature shows that various types of CAM modalities are being used by African Americans. The main CAM modality among this population was prayer, herbal preparations and home remedies. CAM has not fully been explored in all populations and there are still substantial gaps in our understanding of CAM use among women, especially racial or ethnic minorities and immigrants (Upchurch & Chyu, 2005).

**H. CAM and HIV-Infected Individuals**

The use of complementary and alternative medicine (CAM) among HIV/AIDS infected individuals has gained increasing popularity, with utilization rates between 30-80% (Anderson, O’Connor, MacGregor, & Schwartz, 1992; Bates, Kissinger, & Bessinger, 1996; Bica et al., 2003; Knippels & Weiss, 2000; Duggan et al., 2001; Kirksey et al., 2002; Standish et al., 2001). However, the evidence of who among HIV infected persons is more likely to use CAM is somewhat is unclear. Risa et al.(2002) found that in HIV-infected individuals, new users of alternative therapies were significantly more likely to be African American. Kirksey et al. (2002) found that 46% of HIV-infected African Americans used CAM more frequently, where as 38% of Whites and 28% of Latinos used CAM.

There are studies that show that a majority of HIV-infected CAM users are White, female, and have a higher education (Bates et al.1996; Hsiao et al. 2003; Wutoh et al., 2001). Conversely, Bica et al. (2003) found that higher amount of males were CAM users. Other research by Duggan et al. (2001) found no significant difference in gender
for CAM use. HIV infected CAM users tended to have higher incomes than those who did not use CAM (Bica et al., 2003; Duggan et al., 2001; Ostrow et al., 1997). CAM users also tended to be better educated than nonusers of CAM (Bica et al., 2003; Chang, van Servellen, & Lombardi et al., 2003; Hsiao et al., 2003; Mikhail et al., 2004).

I. CAM and Management of HIV-Related Symptoms

Mannheimer et al. (2008) found that individuals who had initiated their first course of antiretroviral therapy, had experienced at least one side effect (nausea, vomiting, diarrhea, oral discomfort, dysphagia, constipation, severe mood changes, fever headache, allergic reaction, dermatitis, fatigue, neurocerebeller symptoms, and peripheral neuropathy). The authors of this study found that side effects were common in the first year of HIV medication use which had significantly affected the patients’ quality of life. CAM use allows patients to alleviate their side effects and allows them to lead relatively normal lives. A study by Foote-Ardah (2003) found that a majority of their participants used CAM to manage HIV health complications as well as control HIV medication side effects. Respondents of this study reported side effects ranging from nausea, fatigue and diarrhea to more severe effects such as vomiting, neuropathy, and pancreatitis. One study found that expectations from CAM use was the overall improvement in quality of life, better immunity, delay in the onset of and reduction in HIV related side effects, pain, and cure and relief from medical treatments (Bates et al., 1996; Pawluch, Cain, & Gillet, 2000; Standish et al., 2001; Tsao, Dobalian, Myers, & Zeltzer, 2005).

Changes in body-fat distribution can occur in HIV-positive patients who are taking HAART. This body fat distribution, called, lipoatrophy, is fat loss from face, arms, and buttocks; fat accumulation can occur around the abdomen and breasts (Cho,
Ye, Dobs, & Cofrancesco, 2006). Cho, Ye, Dobs, and Cofrancesco (2006) found that a small percentage of their participants used CAM for the prevention and treatment of lipoatrophy. Some studies have shown that HIV-infected participants used CAM because it helped them cope with emotional problems and stress (Foote-Ardah 2003; Pawluch et al., 2000; Sparber et al., 2000). CAM was also used as a way to self-regulate their HIV treatment practices. Participants felt as though they were in control of when they took CAM, how often they took it, and what type of CAM they would use.

**J. Type of CAM in HIV-Infected Individuals**

Research shows that HIV positive individuals frequently use acupuncture, message, meditation and herbs (Jernewall, Zea, Reisen & Poppen, 2005). Greene et al. (1999) found that the most frequent CAM therapies used among HIV-infected populations were aerobic exercise (64%), prayer (56%), massage (54%), needle acupuncture (48%), breathing exercises (33%) and spiritual activities (33%). Another national study by Sparber et al. (2000) found that certain CAM therapies increased in use after an HIV diagnosis were imagery, high-dose vitamins, massage, herbal products, spiritual, acupuncture and exercise.

**1. CAM Modalities in HIV-Positive Individuals**

   a. *HIV, Acupuncture and Peripheral Neuropathy.* Peripheral neuropathy is the most frequent neurological complication of HIV (Wulff, Wang, & Simpson, 2000). Peripheral neuropathy can result from the infection of neurons with HIV (Phillips, Skelton, & Hand, 2004). This disorder is diagnosed in 30% to 35% of patients with HIV and can cause pain and dysesthesias (Shlay et al., 1998). There were two studies that showed that acupuncture was effective in the treatment of peripheral neuropathy. One
study by Phillips et al. (2004) showed that 5 weeks of acupuncture therapy significantly reduced pain among HIV-infected persons experiencing peripheral neuropathy ($p = 0.002$). The retrospective study by Galantino, Eke-Okoro, Findley, and Condoluci (1998) found that electro-acupuncture therapy reduced pain and increased physical strength among HIV infected individuals experiencing peripheral neuropathy ($p = 0.02$). There was one study that found no significant differences between the acupuncture intervention group and the control group to reduce peripheral neuropathy in HIV infected patients (Shlay et al., 1998).

b. HIV, Acupuncture, Sleep and Well-being. Symptoms of opportunistic infections of HIV progression often result in sleep disturbances (Phillips et al., 2004). Pain is a symptom that is associated with sleep disturbances which continues to be a major source of suffering for HIV infected individuals. Phillips et al. (2004) looked at the effect of acupuncture on sleep quality in HIV infected participants. Before the intervention, participants in this study had a hard time going to sleep as well as waking up early. The intervention for the participants of this study was acupuncture therapy that was given twice per week for 5 weeks. The authors found that the 5-week acupuncture therapy significantly ($p = 0.01$) improved sleep quality and sleep activity. Another study by Chang, Boehmer, Zhao, and Sommers (2007) found that an acupuncture intervention with the addition of relaxation response tapes, showed improvements in quality of life (emotional, spiritual/peace, physical and mental health) in HIV-infected individuals.

c. HIV, Massage Therapy and Immune Function. Massage therapy has been shown to increase improve immune function such as natural killer CD8 and CD4 cells in HIV infected individuals (Ironson et al., 1996). In a study conducted by Diego et
al. (2001), the use of a message therapy in HIV-infected adolescents, reduced anxiety and significantly ($p < 0.01$) enhanced immune function (increase of natural killer cells) by the end of a 12-week intervention. Conversely, Birk, McGrady, MacArthur, and Khuder (2007) found that when a massage therapy was given alone in HIV participants, there was no significant ($p > 0.05$) difference in CD4 and CD8 cell counts when compared to the control groups. When aerobic exercise was combined with massage therapy, the results remained the same. There was still no significant difference in CD4 and CD8 cell count when compared to the control group.

d. HIV, Exercise and Immune Function. In a randomized controlled study that looked at aerobic exercise, the authors found that those who were randomized to the exercise group had significantly ($p < 0.05$) increased CD4 lymphocyte cells at the end of 5 weeks when compared to the control group (LaPierriere et al., 1990). In another randomized controlled trial, Galantino et al. (2005) found that those participants placed in a T'ai chi intervention group and an aerobic exercise group, showed improvements in quality of life compared to the control group.

e. HIV, Herbs, and HIV-Related Symptoms. The use of herbs has been advocated as an alternative treatment strategy for HIV-related illness (Kassler, Blanc, & Greenblatt, 1991). One study found that 22% of HIV positive participants reported the use for one or more herbs for treatment purposes in the previous 3 months (Kassler et al., 1991). Southwell, Valdez, Lederman, and Gripshover (2002) found that one-third of their HIV-infected participants used at least one of the 57 herbal remedies reported. Moffett, Sanders, Sinclair and Ergil (1994) found that HIV-infected patients that were receiving acupuncture and herbal medicines had reduced numbers and severity of HIV-
related symptoms. There were statistically significant ($p \leq 0.05$) improvements in symptoms such as fatigue, loss of appetite, neuropathy, low-grade fever and skin irritation. A randomized controlled trial by Burack, Cohen, Hahn, and Abrams (1996) showed that life satisfaction improved in an herb-treated intervention group. The study also found that the number of HIV related symptoms was reduced by 13% in subjects receiving herbs but not in those receiving placebo.

Herbal remedies have also been researched in the treatment of AIDS-related diarrhea (Power, Gore-Felton, Vosvick, Israelski, & Spiegel, 2002). A study by Cohen et al. (2000) found that a Chinese herbal remedy, Source Qi, was effective in reducing diarrhea among HIV-positive men. There was no control group for this study and the results were not statistically significant.

Chang and Yeung (1988) tested 27 Chinese herbs for inhibitory activity against HIV in vitro in a H9 cell line. The authors found that out of the 27 herbs tested, 11 had anti-infective properties. All 11 herbs were able to achieve a 97-100% inhibition of the growth of HIV in vitro (H9 host cell).

f. HIV, Cannabis, and Wasting Syndrome. Severe anorexia and wasting syndrome are common illness in people with advanced stage HIV (Beal et al., 1995). AIDS wasting syndrome is the involuntary loss of more than 10% body weight. If not adequately treated, it can be life threatening. AIDS wasting syndrome can develop from poor appetite from HIV infection or HIV medication side effects, such as nausea, diarrhea, and changes in taste; not absorbing nutrients well (HIV affects the intestinal lining); or changes in metabolism (HIV burns calories fast, so you need to take in more calories to maintain your body weight).
The derivative of cannabis is effective in increasing appetite among HIV infected persons (Kuo et al., 2004). It serves as a treatment for AIDS wasting syndrome. Some AIDS patients who have smoked marijuana have stated increased appetite and weight maintenance or gain (Gorter, Seefried & Volberding, 1992). Maintaining a healthy, normal weight is important for the management of HIV infection (Beal et al., 1995). Kuo et al. (2004) explored whether marijuana use was associated with HIV wasting syndrome. The authors also found that those who were taking a monotherapy or non-HARRT combination had significantly \( p<0.001 \) higher incidence rate or weekly marijuana use compared to those who were taking HAART. Overall this study found that the participants with advanced staged of HIV (wasting syndrome) were using marijuana as a means for self-medication.

Abram et al. (2003) looked at the short-term effects on cannabinoids in patients with HIV-1 infections. This randomized, placebo controlled study researched whether or not cannabinoids that was smoked (marijuana) or taken orally in the pill form (dronabinol) would have an effect viral load and CD\(^{8+}\) and CD\(^{4+}\) cells in HIV infected persons. Dronabinol is a synthetically produced compound from delta-9-tetrahydrocannabinol. Dronabinol is also approved for the treatment of anorexia that is associated with weight loss in advanced stage HIV patients (Beal et al., 1997). Over a 21-day intervention, Abram et al. (2003) found that there was no increase in viral load in both the marijuana group and the dronabinol group. The author did however find that those in the marijuana group as well as those in the dronabinol group did have increases in CD\(^{8+}\) and CD\(^{4+}\) cell count when compared to the placebo group. As far as weight gain, the authors found that those in the placebo group gained a median of 1.1kg. Those
in the marijuana and dronabinol group gained a median of 3.0kg and 3.2kg \((p = 0.021)\) respectively. In another study, researchers found that 7 out of the 12 patients who were given dronabinol therapy, gained weight. Median weight change over 3 months prior to therapy was 0.93kg/month and on dronabinol therapy, the median weight gain was 0.54kg/month (Garter et al., 1992). Beal et al. (1995) found that patients who were given a dronabinol treatment had significant improvement in appetite, mood, reduced nausea, and stabilized weight. For all patients, the mean increase for appetite from baseline to end was 37% and 17% in the dronabinol and placebo groups, respectively \((p = 0.05)\). As for weight gain, those in the dronabinol group had a mean weight gain on 0.1kg and those in the placebo group had a mean weight loss of 0.4kg \((p = 0.14)\). Finally, nausea decreased by 22% in patients in the dronabinol group and decreased 4% in patients in the placebo group. This study was able to show that dronabinol was effective for wasting syndrome among HIV-infected individuals. A follow-up study by Beal et al. (1997) showed the same results mentioned in the previous study from Beal et al. (1995). Those participants that were assigned to the dronabinol group still had increases in appetite, weight stabilization and weight gain. The overall finding in this study was that dronabinol could be administered long-term in the HIV population without the development of tolerance, or any risk of toxicity.

\textit{g. HIV, Religion and Prayer.} As mentioned before, religion and prayer is high among HIV-infected populations. A study by Coleman et al. (2006) found that women were more likely than men to use prayer to as a way to manage HIV related symptoms such as fatigue. Men were more likely than women to use prayer as a way for managing other HIV related symptoms such as nausea and depression. The results of this
study show that involvement in prayer and religious activities can be gender specific and effective for relieving HIV related symptoms. The use of prayer among HIV positive individuals has also been associated with positive HIV immune status. Research by McCain et al. (2008) found that HIV positive participants that were randomized into a spiritual intervention had an increased level of lymphocyte proliferation compared to a decrease in the control group (457.88 pg/ml and –428.71 pg/ml respectively). Similarly Woods, Antoni, Ironson, and Kling (1999) explored physiological indicators in HIV positive individuals. The authors found that those who engaged in religious behavior (e.g., service attendance, prayer, spiritual discussion, and reading religious scriptures) in the last 30 days had higher CD4+ counts and higher CD4+ percentages. Similarly a longitudinal study by Ironson, Stuetzle, and Fletcher (2006) found that participants who had an increase in religiousness/spirituality after HIV diagnosis was significantly \( (p<.001) \) related to change in CD4+ cells and viral load over 4 years. Participants who had an increase in religiousness/spirituality after HIV diagnosis had less loss of CD4+ cells and lower increase in viral load compared to those who had a decrease in spirituality after diagnosis.

Religious activities and its effect on HIV-related mortality have also been researched among HIV populations. Fitzpatrick, Standish, Berger, Calabrese and Polissar (2007) explored how the involvement in spiritual activities (e.g., prayer, meditation, affirmation, psychic healing and visualizations) was associated with survival in HIV infected patients. The authors found that among participants who were not taking HAART, those involved in spiritual practices over a year were found to be at reduced risk of death or have longer survival rates compared to those who those who did not engage in
any spiritual activities. This association was not present in participants who were taking HAART.

h. *HIV, Prayer and Ethnicity.* Research by Kaplan et al. (1997) showed that prayer was the highest coping response for HIV among 76% of Latina, White, and Black women with HIV. Owen-Smith et al. (2007) found that 30% of the HIV positive Black women reported using either body work, religious or psychic healing as CAM. Flakerud and Rush (1989) interviewed Black women to explore their traditional health beliefs and how these beliefs related to their AIDS. The authors found that the women believed prayer was most important to them and that the treatment and cure for AIDS were considered to be in “God’s hands”. Participants said that “God is the only one who can cure anything. Doctors can doctor, but only God can heal...if you don’t have faith, AIDS will eat you up. Faith keeps them alive” (Flaskerud & Rush, 1989, p.214).

i. *HIV, Vitamins and Immune Function.* Mikhail et al. (2004) found that vitamins were the most commonly used CAM among their HIV participants. Thirty-five percent of their participants reported that they used vitamins. Fawzi et al. (2004) examined whether multivitamins had an effect on CD4+ and CD8+ cell count and viral load in an HIV infected sample in Tanzania. The participants were randomized into four groups. One group was the multivitamin only group, the second group was the multivitamin plus vitamin A, the third group was vitamin A only and the last group was the placebo group. Researchers found that out of 299 participants who progressed to stage 4 illness or AIDS related causes: 25% died from the multivitamin group, 25% died from the multivitamin plus vitamin A group, 29% in the vitamin A group and 31% in the placebo group. The authors also found that those in the multivitamin group had
significantly reduced oral and gastrointestinal manifestation of HIV disease. The last finding from this study was that CD4 cell counts were higher and viral load was lower among the multivitamin group when compared to placebo \((p = 0.01\) and \(p = 0.02\) respectively). This study showed that multivitamins was efficacious in improving HIV-related diseases as well as CD4 cell counts. Vitamin A used alone, was shown to have weaker effects and was not significantly different from the effects produced by the placebo group. When looking at other vitamins, Tang, Graham and Sarah (1996) showed that several B-group vitamins were associated with increased survival time of up to 1.3 years in an HIV-infected sample. Semba et al. (1993) showed that vitamin A deficiency was associated with decreased immune function among those with HIV. The authors found that significantly \((p < 0.05)\) lower CD4 cell counts were associated with lower vitamin A. The authors also showed that a vitamin A deficiency was also associated with increased mortality \((p < 0.01)\).

\textit{j. HIV, Micronutrients, and Immune Function.} A prospective randomized controlled trial by Kaiser et al. (2006) found that participants who were given a micronutrient supplement (that contain 33 ingredients) had a CD4 count that significantly \((p = 0.029)\) increased by 65 cells versus a 6-cell decline in the placebo group at the end of a 12-week intervention. The mean change in CD4 cell count from baseline to 12 weeks increased significantly \((p = 0.01)\) by 24% in the micronutrient group compared with no change in the placebo group. The authors also noticed changes in HIV-1 RNA viral load level. There was a decrease in viral load in the micronutrient group although not significant \((p = 0.26)\). Neuropathy symptoms were also assessed in this study. The researchers found that neuropathy symptoms were reduced in both groups, but the
micronutrient group’s symptoms improved by 42% compared to the placebo group’s 33% (not significant).

A randomized controlled study by Hurwitz et al. (2007) explored the effects of selenium supplementation on HIV viral load and CD4 counts. The authors found that those in the selenium intervention had significantly less viral load \((p<0.02)\) and greater CD4 count increase \((p < 0.02)\) when compared to the placebo group. Kupka et al. (2004) found that lower selenium levels were associated with increased mortality risk among HIV-infected pregnant women in Tanzania.

K. CAM and HIV Medication Adherence

There are discrepancies in the literature on whether or not CAM use enhances or diminishes HAART adherence among HIV-infected individuals. There are a few studies that found that adherence rates were better in those who were CAM users. Wutoh et al. (2001) found that 25% of the participants reported medication adherence rates less than 100%. Knippels and Weiss (2000) found that among HIV-positive gay men, those who combined their HIV medication with CAM had better adherence to their antiretroviral medication than those who were not using alternative medicine. In a study among HIV positive women, Merenstein et al. (2008) found that women who used CAM were 1.69 times more likely to initiate HAART medication than non-CAM users. Another study conducted by Merenstein et al. (2012) found a 44% increase in HAART adherence rates among participants who are using Vitamin C compared to when they were not \((p = .049)\). A study by Nightingale et al. (2011) found that participants who reported regular religious practices (attending church, prayer, reading sacred scriptures) were significantly \((p = .013)\) more likely to report at least 95% antiretroviral therapy adherence. Although
not significant, Risa et al. (2002) had similar findings. The authors found that alternative therapy users had a higher adherence compared to those who did not use alternative medicine. Hsiao et al. (2003) found that only 3% of patients who used CAM, used it as a substitute for their traditional HIV medication.

Two studies showed that the use of CAM did not improve HIV medication adherence. Jernewall and colleagues (2005) conducted a study to explore the association of “Latino CAM” (traditional healing practices such as Santeria, Espiritismo, Umbanda, Candomble, curanderos, sobadores, parcheros) and HIV medication adherence in HIV positive Latino gay and bisexual males. The authors found that the 13% of individuals who used Latino CAM were less likely to adhere to their HIV medication. Only one study has examined CAM use and medication adherence among HIV-infected Black women (Owen-Smith et al., 2007). The authors found that women using CAM relative to non-CAM users were 1.69 times more likely to report missing HAART doses in the last 30 days. Further investigation is needed to better assess whether CAM is positively or negatively associated with HIV medication adherence particularly among Black women.

L. Complications/Risk of CAM Use and Antiretrovirals

It is important to understand why CAM is used among HIV-infected individuals, given its potentially deleterious interaction effects with traditional HIV medication. It is also important to know if HIV-infected individuals are utilizing CAM as an “alternative” rather than a “complement” to traditional HIV medication. If individuals want to use CAM as an alternative rather than a complement, they could be doing harm to their treatment regimen. If they start HAART medication and then stop and start CAM, these
individuals could possibly build resistance against their HIV medication, if they ever decide to initiate that antiretroviral treatment again.

The widespread use of CAM therapies is of some concern because of their potential impact on the efficacy of conventional treatments (Jones et al., 2006). An intervention by Slain et al. (2005) showed that high doses of vitamin C taken along with the HIV antiretroviral indinavir, led to reduced levels in plasma indinavir concentrations. A study by Piscitelli, Burstein, Chait, Alfaro, and Fallon (2000) found that if the commonly used antidepressant, St. John’s wort is taken with indinavir, reduced concentrations of indinavir can occur. The authors state that the results are important among HIV-infected patients taking these two medications because low plasma concentrations of protease inhibitors are a cause of antiretroviral resistance and treatment failure (Piscitelli et al., 2000, as cited in Clevenbergh, Durant, Chaillou, & Dellamonica, 1999). A similar study found that use of St. John’s wort decreased concentration of the antiretroviral nevirapine (de Matt et al., 2001). Piscitelli, Burstein, Welden, Gallicano and Fallon (2002) investigated the effects of garlic on the HIV antiretroviral drug saquinavir. The authors found that long-term use of garlic led to a significant \( p = 0.007 \) decrease in the plasma concentrations of saquinavir. A similar study by Gallicano, Foster, and Choudhri (2003) saw a decrease in a protease inhibitor retonavir when used with garlic, but these results were not significant. Open-communication between patient and healthcare provider is crucial because the risks of certain types of CAM can be detrimental to the patient’s health.
M. Future Implications/Conclusion

This literature review explored various types of CAM as well as frequency of use among different populations including HIV infected individuals. We explored CAM usage among different ethnic backgrounds, particularly among African Americans. Although the literature shows that alternative medicine use in African Americans is deeply-rooted in cultural tradition, there is still a lack of research on CAM use in Blacks, particularly in women (Bailey, 2002). Bailey (2002) wrote that, “It was alternative medical system and treatment therapies during the 1600s, 1700s, 1800s and early 1900s that kept millions of African Americans alive and well” (p. 146). Because of slavery and discrimination laws, African Americans had to depend on these alternative therapies for treatment and prevention of illnesses.

Identifying patterns of CAM within a specific population can provide the foundation for interventions or clinical trials to test effectiveness of selected treatments (Barnett et al., 2003). It is important to explore CAM use among HIV infected individuals because as the literature review has shown certain CAM uses can dangerously interact with the traditional HIV medication. Power et al. (2002) states that “Understanding the contraindications of alternative therapies is necessary to prevent deleterious outcomes and to facilitate the safe and efficacious use of CAM for managing HIV” (p. 375). If the HIV provider is aware that the patient is using CAM, the provider can engage in open communication and discussion of CAM, specifically the risks and benefits of CAM use.

The literature is inconsistent as to whether CAM enhances or diminishes HIV medication use. There was only one study from the review that looked at whether CAM
had an influence of HIV medication in Black women (Owen-Smith et al., 2007). This study found that Black women CAM users were 1.34 times more likely to be nonadherent to their HIV medication compared to those who did not use CAM. Brown et al. (2007) states that little is known about whether CAM use in African Americans is seen as a complement or an alternative to traditional medical treatment and should be further investigated. Further studies need to be conducted to examine the effects of CAM use on HIV medication adherence. To date, there are no studies that explore attitudes and beliefs of CAM for treatment of HIV in Black women. Littlewood and Vanable (2008) state that “Using theory to conceptualize how patients’ beliefs influence treatment decisions will help to inform the development of interventions designed to improve patient-provider communication regarding CAM and reduce the potential for CAM use to interfere with proper use of conventional treatments” (p.6). Studies that incorporate behaviors and beliefs of CAM usage for different populations would be beneficial (Kronenberg et al., 2006).
CHAPTER 3

METHOD

A. Overview of Design and Participants

The proposed study utilized a cross-sectional, observational, mixed methods design to attempt to better understand complementary and alternative medicine (CAM) use in HIV-infected Black women. The study was divided into two phases: a qualitative phase (phase one) and a quantitative phase (phase two). Study subjects were HIV-positive women from the Los Angeles, Riverside, San Bernardino and Oakland Counties in California. A convenience sample was recruited from HIV clinics, health centers and community organizations serving Black HIV-positive individuals. Directors and case managers of HIV centers, clinics and community organizations that had a large number of Black women were contacted through direct solicitation, email or telephone by the researcher to assess whether they would like to participate in this complementary and alternative medicine study.

B. Participant Inclusion Criteria

Once agency leadership agreed to participate in the study, we were given access to contact eligible individuals. Participants were recruited and were able to participate if they: (a) signed a consent form; (b) were 18 years or older; (c) female (d) have been HIV-positive and on HIV treatment for six months or longer; (e) self-identify as Black/African American; and (f) read and speak English.

A total of 182 HIV-positive Black women between the ages 26-73 from the Northern and Southern California areas participated in the study. Participants were recruited for key informant interviews, focus groups and surveys by posting recruiting
fliers, through word of mouth, referrals from case managers and by direct solicitation by the researcher.

C. Data Collection and Procedures

1. Phase One-Qualitative

Phase one involved the conduct of qualitative exploration of the women’s CAM related beliefs (based on the TPB). In this phase, 12 key informant interviews and two confirmatory focus groups (N = 17) were conducted. Women who were recruited and agreed to participate in the qualitative interviews, were given a consent form to sign. To allow for a better discussion, a gender matched, qualitatively trained Black interviewer conducted the interviews. All interviews were audio recorded and transcribed verbatim.

a. Recruitment and Sampling. Participants for both key informant interviews and focus groups were recruited via word of mouth, posting of fliers and direct solicitation by the student researcher. Announcements at various HIV women’s support groups as well as peer to peer referrals were also used to recruit possible study participants. Participants for this qualitative phase were recruited from various HIV agencies in Los Angeles, Riverside and San Bernardino areas.

b. Key Informant Interviews (KII). Tremblay (1957) stated that “key informants are used primarily as a source of information for various topics…they are interviewed for the purpose of providing a relatively complete ethnographical description of the social and cultural patterns of the group they are from” (p. 688). Phase one of this study began by conducting KII (by following Ajzen’s guidelines for assessing TPB constructs) to explore the women’s behavioral beliefs, normative beliefs, and control
beliefs related to intention of CAM use. The KII questions were developed from Ajzen (2006). Open-ended questions were asked to determine behavioral beliefs about CAM; normative beliefs and CAM; and control beliefs and CAM.

HIV-positive, Black women were approached and asked if they have ever used any of the following to treat their HIV: (a) vitamins; (b) herbal or natural immunity boosters, (c) home remedies; (d) marijuana; (e) dietary supplements; (f) practiced religious healing, such as prayer or participated in specific ceremonies; (g) yoga, acupuncture, T'ai chi, chiropractor, mediation or (h) aromatherapy. Those who stated yes were asked to participate in a key informant interview. To assure triangulation approximately 10-13 women were interviewed (stratified by age and income). Informed consent (which required a signature) was obtained before the start of each interview. Participants were given a small incentive for their time at the conclusion of the interview.

Interviewing proceeded until saturation was reached, meaning that no significant new information arised from the interviewees. All interviews were audio recorded, transcribed verbatim, and field notes with situational events surrounding the interviews were developed and contained main findings of the interviews. The resulting written data was then analyzed using Grounded Theory approaches (Berg, 2003; Strauss & Corbin, 1998). Additionally, two service providers that were knowledgeable about HIV treatment, behavioral patterns and needs of the target women were also interviewed using the semi-structured key informant guide.

c. Focus Groups. Once the responses from the KII were summarized, they were used to inform a confirmatory focus group guide. Two focus groups (N =17) were conducted to further explore women's behavioral, normative, and control beliefs
related to intention of CAM use. A semi-structured outline with open-ended TPB related “starter” questions was used in each of the focus groups. One focus group with ten HIV-positive Black women was conducted at an HIV agency in Los Angeles, CA. The second focus group with seven HIV-positive Black women was conducted at an HIV agency in San Bernardino, CA. At the start of the focus groups, participants and the facilitator reviewed the informed consent, went over purpose of the study, and discussed group participation rules. To allow for a better discussion, a gender matched qualitatively trained Black interviewer conducted both focus groups. Participants were given a small incentive in appreciation of their time at the conclusion of the focus group.

Once the focus group discussions were transcribed, emerging themes were summarized and developed. These themes were then utilized to develop a self-administered survey based on the theory of planned behavior. Conducting a focus group was useful because it encouraged social communication about the issue among participants which facilitated the expression of ideas and experiences that were not fully explored in the key informant interviews (Kitzinger, 1994).

2. Phase Two- Quantitative

a. Instrument Development and Pilot Testing. In phase two, I utilized phase one information to develop a self-administered survey based on the TPB (to measure attitudes, subjective norms, perceived behavioral control with intention of dietary supplements use and spiritual practices) which was later given to approximately 153 Black HIV-positive women. Along with the TPB related items, frequency of CAM use questions, medication adherence questions as well as demographic questions were all included as part of the self-administered survey. Type of CAM, frequency of CAM use,
HIV medication adherence and demographic questions were taken (with the authors permission) from an existing survey that was developed by Owen-Smith, Sterk, McCarty, Hankerson-Dyson, and DiClemente, (2010). The study by Owen-Smith et al (2010) used a mixed methods design to develop and evaluate psychometric properties of a culturally appropriate measure of CAM use in African Americans with AIDS. The reason this study’s CAM survey was chosen for my study was because the authors specifically asked African Americans with AIDS, what kinds of therapies they might include in the CAM definition. From this feedback, the authors were able to create a culturally specific CAM assessment instrument.

To ensure readability and comprehension, a draft of the developed survey was pilot tested with 10 women to assure readability, comprehension, relevancy of questions and appropriateness of length of time. Participant feedback of the instrument was obtained in a feedback focus group format after the women completed the surveys. The women reported that they understood the questions in the survey. Minor comments included that there was a word missing (“make”) from question number 85, which was corrected. All women who pilot tested the survey stated that it was very helpful to go over all of the sections (mainly the theory of planned behavior questions) of the survey prior to taking the survey. One lady suggested that on question 102 “From the best of your knowledge how did you get HIV?” an answer option of “I don’t know” should be added; again, this change was made. All women stated that it was helpful to have someone in the room with them while taking the survey because they were able to get clarification on the survey questions. Although the women felt that the survey had a lot
of sections, it only took them about 20 minutes to complete. Lastly the women stated that $10.00 was much appreciated and a fair amount as an incentive to completing the survey.

It has been reported that Black males trail Black females on a range of key educational outcomes including graduating from high school, enrolling in college and completing college (McDaniel, DiPrete, Buchmann & Shwed, 2011). We therefore assumed that the women’s reading comprehension was high enough to complete our self-administered survey, an assumption that was proven in the pilot testing. Also, the authors (Owen-Smith et al., 2010) who developed part the CAM questionnaire (types of CAM items, frequency of CAM items and demographic items) that was used in this study conducted readability analyses which showed that the questionnaire was at the 7th-grade reading level. The consent form and survey was read verbatim to those women who stated that they could not read and the women answered the questions in an interview style.

The final survey was administered to study participants from the same target group as the qualitative phase: Black/African American women who are HIV-positive receiving care in the greater Los Angeles, Riverside and San Bernardino areas. Women who were users and nonusers of CAM were recruited and invited to participate. When recruitment in the Los Angeles, Riverside and San Bernardino areas became a challenge, we sought other areas for recruitment based on our professional network and the topic at hand. We therefore started to recruited women form the Oakland area using the same criteria as already described earlier.

While the survey was anonymous, we nevertheless obtained written consent form each participating woman. The consent form included the purpose of the study, risks to
confidentiality and a discussion about risk and benefits. Participants were told that they could discontinue taking the survey at any time and were allowed to skip any questions that they were not comfortable asking. We collected 123 surveys from the Southern California areas (Los Angeles, Riverside and San Bernardino) and an additional 37 from Northern California (Oakland). As in the pilot testing, the survey took about 20 minutes to complete and participants were given a small incentive as a token of appreciation for their time.

To minimize accidental missing data, the completed surveys were reviewed by the researcher before incentive was given. If data was missing, the survey was given back to the participant to complete, unless they consciously decided to not answer a particular question.

D. Variables and Measuring Tools

1. Dependent Variables

The primary dependent variable was intention to use dietary supplements and/or intention to use spiritual practices. Since the overall intention statement of CAM use was too broad, the top two most used CAM methods from phase one (dietary supplements and spiritual practices) were selected to use to assess intention. Methods from Ajzen (2006) were used to develop the TPB questionnaire/survey and to measure the constructs of the TPB related, to intention CAM use. Intention to use CAM was assessed using three items: “During the next three months, I intend to regularly (at least twice a week) use dietary supplements/spiritual practices to help control my HIV”; “During the next three months, I plan to use dietary supplements/spiritual practices help control my HIV”; and lastly, “How likely is it that you will use dietary
supplements/spiritual practices to help control your HIV?” A seven-point bipolar scale, ranging from 1 = (strongly disagree) to 7 (strongly agree) was used to measure the first two intention statements. A seven-point bipolar scale, ranging from 1 = (unlikely) to 7 (likely) was used to measure the last intention statement.

The study’s secondary dependent variable was CAM use. HIV-related CAM use was assessed by asking participants whether they had ever used (yes/no) the following methods to treat their HIV in the last 12 months: (a) vitamins; (b) herbal or natural immunity boosters (Chinese or African herbs, herbal teas); (c) home remedies (garlic, salts, baking soda, lemon juice); (d) marijuana; (e) dietary supplements (energy drinks, protein shakes, boost ensure); (f) practiced religious healing, such as prayer or participation in specific ceremonies; (g) yoga, acupuncture, T’ai chi, chiropractor, mediation or (h) aromatherapy.

2. Independent Variables.

a. TPB Related Items. Attitudes, subjective norms, and perceived behavioral control items were measured indirectly (in phase one) using the methods in Azjen (2003). In order to construct the self-administered survey, the indirect measures from phase one was converted into a set of statements for dietary supplements use and spiritual practices use as it reflects a person’s attitudes, subjective norms and perceived behavioral control. All TPB-related survey questions were measured using a seven point Likert response option scale (ranging from 1 = strongly disagree to 7 = strongly agree) for each of the constructs (Ajzen & Fishbein, 1974; Ajzen, Timko, & White, 1982; Ajzen & Driver, 1991) as it pertains to intention of dietary supplements and spiritual practices use.
b. Attitudes. Participants were asked to respond to five items with bipolar adjectives for the statement “Overall, I think my taking dietary supplements/spiritual practices to treat my HIV is...” According to Ajzen (2006) experiential attitude is assessing how it feels to perform the behavior. Experiential attitude was assessed by using the bipolar adjectives “favorable/unfavorable”, and “pleasant/unpleasant. Influential attitudes, reflects whether the behavior achieved something. This type of attitude was assessed using the bipolar objectives “harmful/beneficial” and “positive/negative”. The bipolar adjective “good/bad was included to capture overall evaluation (Ajzen, 2006).

The antecedent to attitudes, behavioral beliefs were assessed by asking the participants to respond to the following statements in relation to dietary supplements use: “My using dietary supplements at least once a month to treat my HIV will result in an increase in my T-cells”; “Taking dietary supplements at least once a month to treat my HIV would help my immune system”; and lastly “Using dietary supplements at least once a month to treat my HIV will give me more energy.” For spiritual practices, behavioral beliefs were assessed by asking respondents to the following statements: “My using spiritual practices at least once a month to treat my HIV will result in having strength”; “Using spiritual practices at least once a month to treat my HIV would help my immune system”; and lastly, “Using spiritual practices at least once a month to treat my HIV will give motivation to keep going.” A seven-point bipolar scale, ranging from 1= unlikely to 7= likely was used to measure the each statement. Outcome evaluations for dietary supplements use were assessed by asking participants to respond to the following statements: “My having higher T-cells is...”; “My having a healthier immune system
is...”; and lastly, “Having more energy during the day is...”. Outcome evaluations for spiritual practices were assessed by asking participants to respond to the following statements: “My having a healthier immune system is”... and “My having more strength is...” and “Having more motivation to keep living is...” A seven-point bipolar scale, ranging from 1= bad to 7= good was used to measure the each outcome statement.

**c. Subjective Norms.** There are two types of subjective norms that are relevant to social norms. The first subjective norm is descriptive norms and the second is injunctive norms. Descriptive norms involve the perceptions of how important others perform the behavior in question. Injunctive norms refer to a person’s perception of which behaviors in a community are typically approved or disapproved. Both descriptive norms and injunctive norms were assessed by asking participants to respond to a set of questions that were developed by Ajzen (2006). Participants were asked to respond to the following statements: “Most HIV positive people like me are taking dietary supplements/spiritual practices at least once a week to help control their HIV”; “Other HIV-positive women approve of my dietary supplements/spiritual practices at least once a week to help control my HIV”; “I feel under social pressure to use dietary supplements/spiritual practices to help control my HIV”; and lastly, “Doing what other HIV positive women do is important to me”.

To assess normative beliefs, the antecedent to subjective norms, participants were asked to respond to three statements: My ____ thinks I should/should not take dietary supplements, where the blank was replaced with doctor, family or friends. For spiritual practices use, the blank was replaced with family and friends. Participants were also asked to respond to the following statement: “People who are important to me would
want me to take dietary supplements to treat my HIV” or for spiritual practices: “People who are important to me would want me to use spiritual practices to treat my HIV.”

Motivation to comply was assessed by asking participants to respond to the following statements: “With regard to taking dietary supplements/spiritual practices to treat my HIV, I want to do what my ___ (doctor, family and friends) thinks and “It is important to me what my peers think about my taking dietary supplements/spiritual practices.” A seven-point bipolar scale, ranging from 1= strongly disagree to 7= agree was used to measure the each statement.

*d. Perceived Behavioral Control.* Direct measures of capability and controllability were assessed using Ajzen (2006) TPB questionnaire. Capability, which measures a person’s confidence in performing a behavior, was assessed by asking participants to respond to the following items: “I am confident that I can take dietary supplements at least once a week, for the next three months”; “There are factors outside my control that could prevent me from taking dietary supplements to treat my HIV” and lastly “Whether or not I use dietary supplements/spiritual practices to treat my HIV is entirely up to me”. Each statement was anchored with a disagree/agree scale. Participants were also asked to respond to the following statement: “Taking dietary supplements to help control my HIV is” anchored with the difficult/easy scale. For dietary supplements use, control beliefs which measures people’s belief of control over the behavior was assessed by asking participants to respond to the following statements: “I am in control of my HIV health when I take dietary supplements”; “Dietary supplements are expensive”; and “Dietary supplements are not readily available.” Each statement was anchored with a disagree/agree scale. Power of control factors were assessed by asking participants to
respond to the following statements: “The cost of dietary supplements would prevent me from taking them”; “Traveling far to get would prevent me from taking dietary supplements”; and “Having a feeling of being in control of my health makes it easier to use dietary supplements.” Each statement was anchored with a disagree/agree scale.

For spiritual practices, control beliefs were assessed by asking participants to respond to the following statements: “Using spiritual practices is free”; “Using spiritual practices is always available”; and lastly “God is in control of my health when I use spiritual practices”. Each statement was anchored with a disagree/agree scale. Power of control factors were assessed by asking participants to respond to the following statements: “The cost of spiritual practices would make it easier for me to use it to treat my HIV”; “Being able to call on God whenever you want would it easier for me to use spiritual practices to treat my HIV”; and lastly “Feeling like God is in control of my health makes it easier to use spiritual practices to treat my HIV.” Each statement was anchored with a disagree/agree scale.

e. Current CAM Experience. Current experience using dietary supplements as well as current experience with using spiritual practices were each assessed using one item: “In the past three months, I have used dietary supplements/spiritual practices at least once a week to treat my HIV.” Both statements were anchored with a true/false scale.

f. HIV Medication Adherence. Notably our recruitment criteria required the participants to have been HIV positive for six months or longer. Standard of care requires immediate treatment with HIV medication. Nevertheless some patient chose to never start and some to not continue with their medication regimen. Participants were
asked whether they were currently on any highly active antiretroviral therapy (HAART) or any other antiretroviral drugs. Those who stated yes to either question were asked about their HIV medication adherence. HIV medication adherence was assessed by asking participants whether they had missed any doses of their prescribed HIV antiretroviral treatment in the last 30 days. Anyone who had missed any of their antiretrovirals in the last 30 days was considered nonadherent. Anyone who was not currently taking any antiretrovirals was automatically considered nonadherent.

*g. Demographic Measures.* Demographic variables included questions about, age in years and length of HIV status (in years). Other demographic data were assessed as categorical variables. Education level of the participants was assessed and categorized as 1 = less than a high school diploma, 2 = High school diploma/GED, 3 = Some college, 4 = College degree, 5 = Some graduate school, and 5 = Graduate degree. Marital status was assessed as 1 = Single, 2 = Divorced, 3 = Separated, 4 = Widowed, 5 = Married and 6 = Partnered. The question of yearly income was assessed as 1 = Less than $15,000, 2 = $15,000-$30,000, 3 = $30,001-$60,000 and 4 = More than $60,000. Participants employment status was assessed as 1 = Full-time worker, 2 = Part-time worker, 3 = Unemployed, 4 = Student, 5 = Disabled, and 6 = Retired. Primary source of health insurance was assessed and categorized as 1 = Private, 2 = Medicare/Medicaid, 3 = Uninsured, and 4 = Ryan White. Participants current housing situation was assessed as 1 = Rent a house, 2 = Rent an apartment, 3 = Own house/condominium, 4 = Live in a group home, 5 = Live in a shelter, 6 = Live with family/friends. Lastly, the participant’s mode of HIV infection was assessed as 1 = Sexual activity, 2 = Drug use (drug needles), 3 = Blood transfusion, 4 = Through birth (from mother) and 5 = I do not know.
E. Data Management

1. Qualitative Data Management

Data was first de-identified and a codebook was developed using line-by-line coding of all key informant interviews and the focus groups. Based on the queried text of the coded data, emergent themes were created and explored. The transcripts, code book, and analytic themed results, were safely stored on a password encrypted thumb drive.

2. Quantitative Data Management

Data was entered into an SPSS database by the student researcher and was stored on a password encrypted thumb drive. To ensure data was entered correctly into SPSS, data was double entered for a random half of the surveys (every other survey). When errors were found, the student researcher re-checked the original paper surveys. Missing data was coded as applicable increments of “9”. Descriptive statistics (histogram, frequency tables, and normality plots) were conducted to see if the statistical test assumptions were met and to explore the data for outliers. Data was also checked for distribution, normality (since this influences choice of statistic) and missing data patterns to determine if some surveys might need to be excluded. However, this was not an issue (>20% missing).

F. Data Analysis

1. Phase One—Qualitative

To answer research question number one (the qualitative portion of this study), we used Grounded Theory (augmented by my theoretical framework) to code the data and explore possible emerging themes from both the key informant interviews and
focus groups. Two key informant interviews were used to develop the codebook, which was then applied to all transcribed data (key informant interviews and focus groups). The coded data was then queried for emerging themes along the lines of the study questions and also for other emerging themes that were not anticipated. The resulting information was then used to help inform the self-administered survey.

2. Phase Two-Quantitative

For the quantitative portion, statistical analyses were conducted using Statistical Package for the Social Science (SPSS) version 21. To explore the second research question regarding how well the proximal theory of planned behavior variables (attitudes, subjective norms, and perceived behavioral control) related to the intention to dietary supplements and spiritual practices use, a series of multiple linear regression analyses were conducted. The dependent variable, behavioral intention (of dietary supplements and spiritual practices) was regressed on three independent variables: attitudes, subjective norms and perceived behavioral control.

To determine if dietary supplements use was associated with HIV adherence (research question number three), a chi square analysis was conducted. The variable dietary supplements use was dichotomized into “yes” or “no” and HIV adherence was also be dichotomized into “yes or “no”. Those who have missed any antiretroviral treatment in the past 30 days were considered non-adherent and placed in the “no” group for HIV adherence.

To test whether there was an association between dietary supplements use/spiritual practices and each of the demographic variables (research question number four) a bivariate analysis was conducted. Dietary supplements use/spiritual practices use
was dichotomized into “yes” and “no”. Demographics included age, income, education marital status, current housing situation, primary health insurance, and length of HIV status.

G. Power Analysis

In planning for the study, several sample size calculations were carried out based on the different statistical tests we planned to use for each of the research questions. Power was calculated using G*Power software (Erdfelder, Faul, & Buchner, 1996). Qualitative research data does not require power considerations since saturation drives the number of a rigorous design. However, for the quantitative phase, the statistical test that required the highest sample size was research question two, namely exploring how attitudes, subjective norms and perceived behavioral control are related to behavioral intention of dietary supplements/spiritual practices use, requiring a multiple linear regression analysis. With an effect size of 0.05 (somewhere between a small and medium effect based on Cohen’s 1992 standards) and an alpha of 0.05, this study had been projected to need 152 subjects to achieve adequate power of 0.80. Since we were able to recruit 160 women our sample was large enough to answer all of the study’s research questions.

H. Strengths and Limitations

Strengths of this study are several. To help us contextualize this challenging topic, a mixed method design was utilized. Mixed methods designs can be useful in research because narratives from qualitative data can be used to add information to qualitative data and vice versa. Using a mixed method design can answer broader and a more complete range of research questions because the researcher is not confined to a single method or
approach. Lastly, a mixed methods design is useful in research because it can provide stronger evidence for a conclusion through convergence of findings (Johnson & Onwuegbuzie, 2004). Another strength is the innovation and high public health significance of the topic, given the high rates of HIV positive Black women and relatively little published research. Exploring this topic allows us to better serve this population who has experienced higher than average death rates. A limitation of this study was that we used a cross-sectional design, thereby limiting our ability to come to causal conclusions about CAM use and the other independent variables. Another limitation is that the results cannot be generalized to all HIV-infected women because the participants of this study were only African American. Additionally, this study included only English-speaking women who were physically able to participate in this study, and who were able to participate complete a self-administered survey (i.e., thus they must have sufficient reading and comprehension skills). The last limitation is that data are dependent upon respondent’s self-report, (i.e. accuracy as well as knowledge) of CAM therapies and/or their willingness to report use accurately.

I. Research Ethics

Loma Linda University’s Institutional Review Board (IRB) approval was obtained prior to data collection. In phase one of this study, I requested active participant consent since by its very nature all qualitative research had some risk of loss of confidentiality. For phase two of the study, I collected fully de-identified anonymous data with obtain signed informed consent because of the sensitivity of the issue of HIV/AIDS. Once data was collected, it was de-identified and assigned an ID number to protect participant’s confidentiality.
The consent forms were first verbally explained by the researcher and then presented to the participants prior to the start of the key informant interviews, focus group and the distribution of the surveys. The consent forms explained the purpose of the study, the minimal risks and benefits, the compensation, the participant’s rights, and whom to call if the participants had any questions or problems. Participants were told that participation was completely voluntary, would in no way affect their ability to access care or the quality of their care and that if they came across questions that made them uncomfortable, they could discontinue the survey or simply skip the question. To ensure confidentiality, there were no identifiers anywhere on the self-administered survey. Additionally, confidentiality was ensured by storing all consent forms in a locked file cabinet at Charles Drew University that was only accessible to the student researcher.

Data files are currently kept on a password encrypted computer as well as a password encrypted thumb drive. To protect the confidentiality and privacy of the participants, all of the consent forms as well as the completed self-administered surveys will be kept for three years and then destroyed/shredded.
CHAPTER 4

FIRST PUBLISHABLE PAPER

Exploring Salient Beliefs About Complementary and Alternative Medicine in HIV-Positive Black Women Using the Theory of Planned Behavior

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ABSTRACT

Using the Theory of Planned Behavior (TPB), this study utilizes qualitative methods (key informant interviews, n = 12 and focus groups, n = 17) to explore HIV-positive Black women's salient beliefs about using complementary and alternative medicine (CAM) as part of their HIV treatment. Emerging themes from both the individual and group interviews were developed using Grounded Theory methodologies. Behavioral beliefs revealed what the women perceived to be advantages (e.g., increase in CD4+) and disadvantages (e.g., non-adherence to current HIV medication) to using CAM for treatment of HIV. Important external normative referents (e.g., family members) that either supported or denied CAM behavior were identified. Lastly, control beliefs, that either facilitated (e.g., feeling of being control of own health) or hindered (e.g., cost) CAM use were also identified. Further implications from this study suggest that the TPB should be used in identifying and targeting salient beliefs that explain CAM use among HIV-positive individuals.

Keywords: complementary and alternative medicine (CAM), theory of planned behavior; Black; HIV/AIDS; behavioral beliefs, normative beliefs; control beliefs

In this paper, we primarily use the term "Black" to refer to all individuals of African descent, however, we also use the term African-American particularly when citing published studies. Black and African American will be used interchangeably throughout this paper.
INTRODUCTION

Blacks/African Americans are impacted by new infections with the HIV at an alarming rate. HIV infection remains a substantial problem for minority women, particularly Black women. By the end of 2008, HIV was the third leading cause of death among Black women ages 35-44 in the U.S. (CDC, 2011). In 2009, Black women accounted for 30% of the estimated new HIV infections among all Blacks (CDC, 2011). While prevention remains, a major effort targeting treatment efficacy and modalities for this sub-group need also to be better understood.

Current HIV medication, which is referred to as highly active antiretroviral therapy (HAART), is a combination of HIV oral medications used to treat HIV. In addition to HAART, many infected persons consider the use of additional methods to help them deal with HIV infection or the side effects of HAART itself. In general, patients who suffer from chronic illnesses turn to alternative medicines because of a desire to become involved with their healthcare decisions and also because of dissatisfaction with conventional medications (Astin, 1998; Barnes, Powell-Griner, McFann, & Nahin, 2004). Because of this satisfaction, HIV infected populations have turned to other forms of treatment, specifically complementary and alternative medicines.

Generally speaking, complementary and alternative medicine (CAM) is defined as a broad range of healing therapies and products (e.g., nutritional supplements, herbal remedies, acupuncture, prayer, etc.) that are typically not commonly integrated with conventional medicine nor widely taught in Western medical schools (Eisenberg et al., 1993). CAM usage in the U.S. has gained popularity over the last decade. A national telephone study reported that, between 1991 and 1997, general CAM use in the U.S.
increased from 33% to 42% (Eisenberg, et al., 1998). CAM use for general health has been used by various racial/ethnic groups especially among Blacks. A study by Brown, Barner, Richards and Bohman (2007) found that CAM use among Black participants was found to be 67.6%. However, research on reasons for CAM use by Blacks, for AIDS or other chronic health conditions, is scarce (Barner et al., 2010). Similar to the general population, their engagement with CAM is used to treat a variety of illnesses such as asthma, various cancers, diabetes, arthritis, and depression (Bazargan et al., 2008; Bright-Gbebry et al., 2011; Brown et al., 2007; George et al., 2006; Hipps et al., 2009; Jones et al, 2006; Jones et al., 2007; Ryder, Wolpert, Orwig, Carter-Pokras, & Black, 2008).

The use of CAM among HIV/AIDS infected individuals has gained increasing popularity, with utilization rates estimated between 30-80% (Duggan, Peterson, Schutz, Khuder, & Charkraborty, 2001; Knippels & Weiss, 2000; Mikhail et al., 2004).

Specifically looking at CAM use among HIV positive Blacks, Risa and associates (2002) found that among HIV-infected individuals, new users of alternative therapies were significantly more likely to be Black. Similarly, Kirksey and colleagues (2002) found that among HIV-infected individuals, 46% of Blacks used CAM more frequently, compared to 38% of Whites and 27% of Latinos.

In order to understand beliefs surrounding complementary and alternative medicine use, the Theory of Planned Behavior (TPB) was selected as the theoretical framework for this study. The theory of planned behavior has been used to investigate a wide range of health related behaviors, including HIV/AIDS (Conner, Kirk, Cade, & Barnett, 2001; Jemmott & Jemmott, 1991; Kassem, Lee, Modeste & Johnston, 2003; Pawlak et al., 2008; Rah, Hasler, Painter, & Chapman-Novakofski, 2004; Spink, Wilson,
& Bostick, 2012; Wambach, 1998). According to the model, intention is determined independently by three constructs: attitudes, subjective norms, and perceived behavioral control (Ajzen, 1991). Attitudes represent positive and/or negative beliefs about a certain behavior. The antecedent to attitudes, are behavioral beliefs that links the behavior to a certain outcome that are either positive or negative (outcome evaluations). Subjective norms are perceived social pressures from significant others that encourage the target behavior. Normative beliefs are the likelihood that important social referents will approve or disapprove a given behavior and the motivation to comply with these social referents expectations. The last construct, perceived behavioral control, refers to a person’s perception of the ease or difficulty of performing the behavior of interest.

Control beliefs (antecedent to perceived behavioral control) are influenced by factors that increase or decrease the perceived difficulty of the behavior and the perceived power that these factors will inhibit or facilitate the behavior. In general, high positive expectations, supportive normative beliefs and strong control beliefs, together can influence a person’s behavioral intentions toward engaging a particular behavior.

**PURPOSE**

According to Ajzen’s theoretical framework, understanding the associations between theoretical variables and behavior, allows health professionals to develop strategies that target these TPB variables as they relate to behavior. To date, there are no studies that explore salient beliefs of CAM for treatment of HIV in Black women.

This study’s primary purpose was to identify the theory of planned behavior constructs of behavioral beliefs, normative beliefs, and control beliefs related to CAM use for treatment of HIV among Black women.
MATERALS AND METHODS

We used qualitative methods to elicit information from HIV-positive Black women about their salient beliefs of CAM use for treatment of their HIV. A total of 29 women participated in the qualitative interviews. Twelve key informant interviews (KII) and two focus groups (FG #1 n= 7 and FG #2 n= 10) were conducted. All interviews were conducted in English, audio-recorded, transcribed verbatim, and the resulting written data was then analyzed using Grounded Theory approaches (Berg, 2003; Strauss & Corbin, 1998).

A convenience sample using peer-to-peer referrals was utilized to recruit participants by posting fliers and direct solicitation by the researcher. Black women who were over the age of 18, had been HIV positive for 6 months or longer, on HIV treatment for 6 months at any point in their lifetime, and were using CAM (i.e., vitamins, herbal, or, home remedies, spiritual practices; acupuncture, T'ai chi, etc.) were allowed to participate in this study. Recruitment took place at HIV centers and agencies around Southern California (Los Angeles, Riverside and San Bernardino Counties). To allow for a better discussion, a qualitatively trained Black interviewer conducted the interviews and focus groups. Participants were given a small gift of appreciation ($10 gift card) at the conclusion of the interviews. Active consent was obtained from all participants per Loma Linda University Institutional Research Board who approved the study.

Key Informant Interviews (KII)

To guide the KII, a semi-structured interview guide was developed following Ajzen's (2006) guidelines for assessing TPB constructs. The questions were developed to guide discussion about salient beliefs (behavioral, normative, and control beliefs)
related to CAM use to treat HIV. To get a better sense of the CAM modalities used in this population, a question about the type of CAM currently (within the last 12 months) using was asked in the semi-structured guide. The key informant interviews were conducted at local HIV treatment centers and social services agencies. The key informant interviews were audiotaped and lasted approximately 30-40 minutes in length.

**Focus Group (FGs)**

Responses from the KIIs were transcribed and summarized and then used to inform a confirmatory focus group guide. Two FGs with a total of 17 women (seven in one group, ten in the other) further explored women’s salient beliefs related to experience with CAM for treatment of HIV. The focus groups were audio recorded and discussions were transcribed, analyzed and coded for emerging themes.

**RESULTS**

Our results show that more than half (55%) of the women who participated in the individual and group interviews were currently using spiritual practices (attending church, participating in religious ceremonies, using blessed oils, and prayer) as a current CAM modality to treat their HIV. Nearly half (55%) of the women were currently using some type of dietary supplements (Boost, Ensure, Noni/Nuni juice). Garlic and green tea were also mentioned as a modality by the women (28% and 21%, respectively). Other CAM therapies such as exercise (17%), tai chi/yoga (14%), aromatherapy (10%), vitamin C (6%), herbs (6%), and meditation (3%) were also identified, but less frequently than spiritual practices and dietary supplements (Table 4.1).

The results of the focus group interviews were consistent with the results of the key informant interviews surrounding the three TPB salient beliefs regarding CAM use
for treatment of HIV. From the KIIIs and focus groups, a summary of key themes, TPB concepts and frequencies of each of the belief statements were developed and provided in Table 4.2.

Behavioral beliefs: Advantages and Disadvantages

Participants discussed the advantages of using various CAM modalities for treatment of their HIV. The primary advantages mentioned included: increase in CD4 cells (45%), belief that God gives strength/motivation to keep going (38%), and increase in energy (20%). For example:

"Yeah, the juice help me because, I guess it was the juice-my T-cells went up from like uh maybe they were like 8 something and they went up to 1200 in like one point in time then I stopped drinking the juice, then they dropped so I started drinking the juice again."

"Because that is where I get my strength from and if it weren't for that I don't think I would be able to deal with it because it is more of a mind thing than it is physically... I pray, that's what keeps me here."

"It is easier because it helps me and I get a lot of energy behind it. You know I feel, I don't feel tired, rundown, you know like sometimes when you are taking meds, you get drowsy, lazy, don't want to do nothing today, you know what I am saying."

Women mentioned other advantages of using CAM, though they were raised by fewer women. Some of these advantages mentioned include: decrease in HIV viral load (17%), increase appetite or weight (17%) and experiencing no side effects when using CAM (14%). Some examples include:

"I think the garlic is really I don't know about the salt or sugar but it is really good for HIV people, it really helps the immune system. It really does. Now Imma uh um research experience of it, I took the garlic and it knocked my-I had 35,000 and by eating a lot of garlic I went down to about 107 viral load."
"Well there is no side-effects. The regular pharmaceuticals it's expensive and there is side effects. With the alternatives a lot of them are inexpensive and there is no side effects."

There were not many perceived disadvantages to CAM use mentioned by the women in this study. In fact, over 90% of the women stated that they did not perceive any disadvantages in using CAM. However, a few women noted that one potential disadvantage was CAM may interfere with their HIV medication. Six percent of women noted that another disadvantage was that while using CAM, they often times were not adherent to their HIV medication. Lastly, 6% stated that a CAM method (e.g., Noni juice) made them sick and they were forced to immediately discontinue using it. Thus, while most women experienced no drawbacks to using CAM, a handful did recognize there were disadvantages.

"At first I was taking 7 pills a day, that's why I wouldn't take it, that's why I would thrive on buying that Noni juice, that's too many pills to take a day and not just one time a day, I was taking that three times a day-7 in the morning, 7 at lunch time and 7 in the evening when you eating dinner. That's 21 pills a day, you think I did not want to take that Noni juice and I am taking all them pills a day?"

Normative beliefs: Social Network Approval and Disapproval

Women mentioned people in their lives who they believed did or did not approve of their CAM behavior. Family members, such as siblings, parents, and adult children were the most mentioned salient referents (66% of women) who approved of the CAM behavior. Depending on the HIV clinic, the next frequently mentioned salient referents were the women's doctor (28%). Other HIV-positive women were also identified (by 20%) as people who approved of their CAM behavior. There were not many referents in the women's lives who disapproved of their behavior. One paradox was that a few of the
perceived referents who approved of their CAM behavior were also identified in other women as people who disapproved this behavior. For example, doctors were mentioned as a referent that did not approve of the CAM behavior. Some of the women highly valued their doctor’s opinion about CAM and stated that they would discontinue its use at the doctor’s request. Interestingly, other women stated that they would still continue to use CAM against their doctor’s orders because they knew their own bodies and what worked best for them. Lastly, only one woman identified a family member as a person who disapproved of her CAM behavior.

Control beliefs: facilitators and barriers

The most frequently stated belief (20%) on why the women found it easy to use CAM was that they felt they could use these alternative medicines at their own control. Another 20% stated that they believe it was easy to take complementary and alternative medicine because God is in control of their life and if they believe in Him, He will heal them of their sickness (HIV).

One of the biggest barriers of using CAM mentioned by over half of the women was the cost. Some women expressed that if they could not afford the alternative medicine then they would have to discontinue use of it. Additionally, another 14% of women stated that traveling far to get these alternative medicines was a barrier to not using them. A few of the women mentioned that they had to travel two to three counties just to find a dietary supplement called Noni juice. Here is an example:

“Yeah it’s the price. If I had like I said I had finished the first bottle and I wasn’t able to get you know go back and buy more because of the price.”
DISCUSSION

Incorporating theory to conceptualize how beliefs influence treatment options can help inform how to develop CAM interventions (Littlewood & Vanable, 2008). The purpose of this study was to utilize TPB to explore salient beliefs related to CAM use among HIV positive Black women.

African Americans are more likely to use prayer, herbal and home remedies for health treatment and preventive purposes. Research shows that prayer is more likely to be considered a daily activity among African Americans. In this study, we found that spiritual practices (which include prayer) were widely used as a CAM modality by over half of the women. Our finding is also consistent with other studies that show that women are more religious than men in the general population (Sherkat & Ellison 1999) and among African Americans (Levin, Taylor, & Chatters, 1994; Martin, 1984). The National Survey of Black Americans showed that 84% of Black women pray nearly every day compared to only 68% of Black men (Taylor et al., 2004). Thus, the finding that prayer or other spiritual practices is used to manage HIV/AIDS in our study is supported by other research that shows that prayer is an important part of HIV treatment (Coleman et al., 2006; Parson et al., 2006).

Participant’s beliefs about the primary advantages and disadvantages regarding the use of CAM were identified in this study. The most frequently mentioned advantage was that women believed that their CD4+ cells increased. Numerous studies have shown that using various types of CAM does have an effect on improving immune function in HIV-infected persons (Hurwitz et al., 2007; Kaiser et al., 2006; Tang, Graham & Sarah, 1996; Woods, Antoni, Ironson, & Kling, 1999). Another advantage mentioned was that
use of spiritual practices/prayer gave them the strength/motivation to deal with their HIV virus, which is consistent with other research. For example, Fitzpatrick and colleagues (2007) explored how involvement in spiritual activities was associated with survival in HIV infected patients. The authors found that participants (not on HAART) involved with spiritual practices, were at reduced risk of death or had longer survival rates compared to those not engaged in any spiritual activities. Fourteen percent of the women in our study stated that an advantage for using CAM was that they did not experience any side effects for these alternative medicines. This is consistent with a study by George et al. (2006) who found that factors such as wanting a natural approach to medicine and obtaining symptom relief promoted positive attitudes of CAM use for the treatment of asthma in African Americans. One disadvantage noted by a small number of women was while using CAM, these women were not regularly adherent to their traditional HIV medication. Studies have shown that CAM users were not adherent to their HIV medication (Owen-Smith et al., 2007). Reasons for this relationship between CAM usage and lower adherence to conventional treatment need to be explored further.

A range of people (e.g., doctor, family members, and other HIV-positive women) were identified as important social referents such as family members who approved of women’s CAM behavior. Similarly, Kaufman and Gregory (2007) found that CAM use was associated with agreement for the practice by those in a person’s social network. The authors also reported that HIV participants who used CAM stated that people close to them had recommended alternative practitioners to them. This implies that a person’s social support system does have a role in whether a person decides to use alternative therapies. In another study, Chao and friends (2006) found that for minority women
(Mexican, African American and Chinese American women), CAM use by family members positively influenced their decision to use CAM.

Studies show that those who use CAM do so because it makes them feel as though they are in control of their treatment or have some role in their treatment decisions (Foote-Arad, 2003; Furham & Foray, 1994; Furham & Lovett, 2001). Twenty percent of the women in our study stated that having a sense of control over their own health, made it easy for them to use CAM to treat their HIV. The women felt as though the doctors did not know their bodies like they did. This finding is consistent with Flickered and Rush (1989) who interviewed Black women to explore their traditional health beliefs and how these beliefs related to their AIDS. The authors found that the women believed prayer was the most important to them and that the treatment and cure for AIDS were considered to be in “God’s hands”. Participants from that study said, “God is the only one who can cure anything. Doctors can doctor, but only God can heal...if you don’t have faith, AIDS will eat you up” (p.214).

The biggest barrier for over half of the women was the cost of CAM, particularly the dietary supplements (Boost, Ensure, Noni/Noni juice). For example, a few of the women used a dietary supplement called Noni juice and retail price is $170 per liter bottle. Most of the women in this study were low-income with limited resources, and trying to buy such expensive products would be a hardship.

CONCLUSIONS

This study provides the first step in understanding the underlying beliefs that guide decisions to use CAM among HIV-positive Black women. Perceived advantages and disadvantages of using CAM, social referents and perceived factors that made CAM
behavior easy or difficult were identified among HIV-positive Black women. The beliefs identified as part of this study can be used to inform HIV providers about alternative medicine use. Gaining a better understanding of CAM use among those currently receiving HIV treatment is important to promoting a more open communication between patient and healthcare provider.

There are a few limitations in this study. First, the generalizability of the results is limited due to the population and methodology used in this study. The participants were primarily low-income, HIV positive Black women in the Los Angeles, San Bernardino and Riverside areas so these results are limited to similar populations. Another limitation is that data are dependent upon respondent’s self-report (i.e. accuracy as well as knowledge) of CAM therapies and/or their willingness to report use accurately.

One strength of this study is that we were able to explore personal experiences about CAM use and HIV among a sub-population not often studied. Studies that incorporate behaviors and beliefs of CAM usage for different populations would be beneficial (Rosenberg et al., 2006). Further studies investigating TPB related concepts and CAM use among HIV Black women need to be conducted in order to determine if these findings can be replicated.
Table 4.1 Type of Complementary and Alternative Medicine Currently Using (Within the last 12 Months)

<table>
<thead>
<tr>
<th>Type of CAM</th>
<th>Total (N = 29)</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spiritual Practices/Prayer (church attendance, blessed oils, etc.)</td>
<td>16</td>
<td>55%</td>
</tr>
<tr>
<td>Dietary Supplements (Ensure, Nuni/Noni and Boost)</td>
<td>15</td>
<td>52%</td>
</tr>
<tr>
<td>Garlic</td>
<td>8</td>
<td>28%</td>
</tr>
<tr>
<td>Teas</td>
<td>6</td>
<td>21%</td>
</tr>
<tr>
<td>Exercise</td>
<td>5</td>
<td>17%</td>
</tr>
<tr>
<td>Tai’ Chi/ Yoga</td>
<td>4</td>
<td>14%</td>
</tr>
<tr>
<td>Aromatherapy</td>
<td>3</td>
<td>10%</td>
</tr>
<tr>
<td>Vitamin C</td>
<td>2</td>
<td>6%</td>
</tr>
<tr>
<td>Herbs (including marijuana)</td>
<td>2</td>
<td>6%</td>
</tr>
<tr>
<td>Meditation</td>
<td>1</td>
<td>3%</td>
</tr>
</tbody>
</table>
Table 4.2 Summary of Key Themes and Frequencies of Behavioral, Normative and Control Beliefs Among HIV Black Women (N = 29)

<table>
<thead>
<tr>
<th>Concept</th>
<th>Key themes</th>
<th>Total (N = 29)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Behavioral beliefs</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Advantages</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Increase CD 4+ T cells</td>
<td>13 (45%)</td>
<td></td>
</tr>
<tr>
<td>Belief in God gives me motivation/strength to keep going</td>
<td>11 (38%)</td>
<td></td>
</tr>
<tr>
<td>Increases energy</td>
<td>6 (20%)</td>
<td></td>
</tr>
<tr>
<td>Decrease in viral load/undetectable</td>
<td>5 (17%)</td>
<td></td>
</tr>
<tr>
<td>Helps increase appetite/weight</td>
<td>5 (17%)</td>
<td></td>
</tr>
<tr>
<td>No side effects</td>
<td>4 (14%)</td>
<td></td>
</tr>
<tr>
<td>Disadvantages</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Interferes with ability of HIV medication to work effective</td>
<td>4 (14%)</td>
<td></td>
</tr>
<tr>
<td>Not adherent to HIV medication</td>
<td>2 (6%)</td>
<td></td>
</tr>
<tr>
<td>Dietary supplements got me sick-Did not like the way it made me feel</td>
<td>2 (6%)</td>
<td></td>
</tr>
<tr>
<td><strong>Normative Beliefs</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Approve</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Family members</td>
<td>19 (66%)</td>
<td></td>
</tr>
<tr>
<td>Doctor</td>
<td>8 (28%)</td>
<td></td>
</tr>
<tr>
<td>Other HIV positive women</td>
<td>6 (20%)</td>
<td></td>
</tr>
<tr>
<td>Friends</td>
<td>2 (6%)</td>
<td></td>
</tr>
<tr>
<td>Disapprove</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Doctors</td>
<td>3 (10%)</td>
<td></td>
</tr>
<tr>
<td>Family member</td>
<td>1 (3%)</td>
<td></td>
</tr>
<tr>
<td><strong>Control beliefs</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Facilitators</td>
<td></td>
<td></td>
</tr>
<tr>
<td>God is of higher power in control and will not fail you</td>
<td>6 (20%)</td>
<td></td>
</tr>
<tr>
<td>Feel in control/take alternative medicine whenever you want</td>
<td>6 (20%)</td>
<td></td>
</tr>
<tr>
<td>Barriers</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Expensive</td>
<td>16 (55%)</td>
<td></td>
</tr>
<tr>
<td>Not readily available (locally)</td>
<td>4 (14%)</td>
<td></td>
</tr>
</tbody>
</table>
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antiretroviral therapy. *International Journal of STD AIDS, 13*(10), 706-713. doi: 10.1258/095646202760326471


CHAPTER 5
SECOND PUBLISHABLE PAPER

Antiretroviral Medication Adherence and Dietary Supplements Use Among HIV-Positive Black Women in California

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ABSTRACT

Nutritional and dietary supplements are probably the most widely used complementary therapies in HIV/AIDS management in the United States. There is still debate in the literature about whether the use of complementary and alternative medicine (CAM) enhances or diminishes HIV medication adherence among HIV-infected individuals. The purpose of this study was to investigate the association between dietary supplements use and adherence to conventional HIV medication. In this cross-sectional study, 153 HIV-positive Black women, ages 26-73, completed a self-reported survey that assessed HIV medication adherence and dietary supplements use. Under half (45%) of the participants reported use of a dietary supplement. There was no significant difference in conventional HIV medication adherence or demographic characteristics between users and non-users of dietary supplements ($p > 0.05$). Further studies are necessary to better understand how complementary and alternative medicines may influence medication adherence among people living with HIV/AIDS.

Keywords: Antiretroviral Treatments; African Americans; HIV/AIDS; Medication Adherence, Complementary and Alternative Medicine

In this paper, we primarily use the term “Black” to refer to all individuals of African descent, however, we will also use the term African American particularly when citing published studies. Black and African American will be used interchangeably throughout this paper.
INTRODUCTION

The Black community is severely affected by new infections with HIV/AIDS at an alarming rate. HIV infection remains a substantial challenge particularly among Black women. In 2005, Black females accounted for 66% of all women diagnosed with HIV in the U.S. In 2006, HIV was the third leading cause of death among Black women ages 35-44 in the United States (CDC, 2007).

While prevention is critical, our knowledge about treatment efficacy and modalities for this sub-group is emerging and needs to expand, especially given that the causes of shorter HIV survival rates among Black women are not well understood. Current HIV medication, which is referred to as highly active antiretroviral therapy (HAART), is a combination of HIV oral medications used to treat HIV. This antiretroviral therapy does not cure HIV, but it can lower the level of HIV in the body and prevent destruction of the immune system. To slow the progression of HIV to AIDS, a critical component of effective antiretroviral treatments is patient adherence (Merenstein et al., 2009). Death rates for HIV-infected people have dramatically decreased since the release of HAART in 1996 (Bhaskaran et al., 2008) with a 44% drop in deaths for the United States (Cheever, 1999).

In addition to HAART, many infected persons consider additional methods to help them deal with HIV infection and/or the side effects of HAART itself. Patients who suffer from chronic illnesses (such as cancer or HIV) turn to complementary or alternative medicine because of a desire to become involved with their healthcare decisions and because of dissatisfaction with conventional medications (Astin, 1998; Barnes et al., 2004). Generally speaking, complementary and alternative medicine
(CAM) is defined as a broad range of healing therapies and products (e.g., nutritional supplements, herbal remedies, prayer, etc.) that are currently not integrated with conventional medicine and are not widely taught in Western medical schools (Eisenberg et al., 1993). One national study reported that CAM use for the general population in the U.S. increased from 33% to 42% between the years 1991 and 1997 (Eisenberg, et al., 1998). The use of CAM among HIV/AIDS infected individuals has gained increasing popularity, with utilization rates estimated between 30-80% (Duggan et al., 2001; Knippels & Weiss, 2000; Mikhail et al., 2004). Risa and associates (2002) found that among HIV-infected individuals, new users of alternative therapies were significantly more likely to be Black.

There is still much debate in the literature about whether the use of CAM enhances or diminishes medication adherence among HIV-infected individuals. A few studies found that adherence rates were better in those who were CAM users. Specifically looking at religion as a form of CAM, Nightingale et al. (2011) found that participants who reported regular religious practices (attending church, prayer, reading sacred scriptures) were significantly ($p = .013$) more likely to report at least 95% antiretroviral therapy adherence compared to those who did not report regular religious practices. Other forms of CAM have shown to also enhance adherence rates among those who are HIV-positive. For example, Merenstein et al. (2012) found a 44% increase in HAART adherence rates among participants who are using Vitamin C compared to the period of time (12 months) when these same participants were not using Vitamin C ($p = .049$). Knippels and Weiss (2000) found that among HIV-positive gay men, those who
combined their HIV medication with CAM had better adherence rates to their antiretroviral medication than those who were not using alternative medicine.

Conversely, there are two studies that found that the use of CAM did not improve HIV medication adherence. Jernewall and colleagues (2005) conducted a study to explore the association of “Latino” CAM (traditional healing practices such as Santeria which is a type of religion, and use of curanderos or traditional healers), “Asian” CAM (e.g., massage, acupuncture, Qi Gong, etc.), “plant based” CAM (i.e., herbs) and HIV medication adherence in HIV positive Latino gay and bisexual males. Jernewall and colleagues (2005) found that individuals who used Latino CAM were less likely than those using Asian and plant based CAM to adhere to their HIV medication. In one published study to date that has examined CAM use and medication adherence in HIV-infected Black women (Owen-Smith et al., 2007), the investigators found that CAM users were 1.69 times more likely than non-CAM users to report missing HAART doses in the last 30 days. These contradictory findings among various study populations imply that more research is needed to determine the association of demographics and other variables that may be related to CAM use and adherence to conventional HIV therapy.

The primary objective of this study was to investigate patterns, and reasons for dietary supplements use, and its potential association with conventional medication adherence among HIV-positive Black women. This study will also look at demographic differences between users and non-users of dietary supplements.

**METHOD**

**Participants**

We used a quantitative survey to elicit information from 153 HIV-positive Black
women about dietary supplements use for treatment of their HIV-infection. Women who were eligible to participate were over the age of 18, self-identified as Black or African American, had an HIV diagnosis and were able to speak and read English. Women had to have used antiretroviral therapy for six months or longer at some point in their lifetime.

**Procedure**

Participants were recruited from various agencies in Southern and Northern California that provided HIV treatment and social services to Black women. A convenience sample using peer-to-peer referrals and direct solicitation by the researcher was utilized to recruit participants. Potential participants were screened for eligibility and consented if they agreed to participate in the study. The study was approved by the Loma Linda University Institutional Review Board (IRB) and active written consent was obtained.

The survey was based on our previous study that included qualitative interviews to explore salient beliefs about CAM use for treatment of HIV. Using this qualitative data, the survey was developed and pilot tested among women who fit the inclusion criteria. Post-interviews were conducted with pilot tested individuals to obtain feedback on length and comprehension of the survey. According to the pilot tested individuals, there were a few minor changes needed for the survey. Once these changes were made, the survey was IRB approved and ready for distribution. Women who expressed that they had no difficulty with reading completed the survey themselves; alternatively, for those who chose to be interviewed, the survey was administered in interview format by the first author. The survey took about 20 minutes to complete and participants were given a small incentive ($10 gift card) for their time at the conclusion.
Measures

**Dietary Supplements Assessment.** Dietary supplements use was assessed by asking the participant, “Are you currently using any type of dietary supplements to help control your HIV?” Type and frequency of dietary supplements use was also assessed in this study (Owen-Smith et al., 2010). Options for dietary supplements were gathered from our previous qualitative phase that explored salient beliefs about complementary and alternative medicine for treatment of HIV. In addition, we assessed whether dietary supplements use occurred before or after HIV diagnosis to see if the diagnosis use.

**HIV Medication Adherence Assessment.** Participants were asked if they were currently using any antiretroviral therapy. HIV medication adherence was measured by asking participants, “In the last 30 days have you missed any of your HIV medication?” (Owen-Smith, Diclemente & Wingwood, 2007). A participant was considered “non-adherent” if she missed any HIV medication doses in the last 30 days. For the purposes of this study, participants who were not currently taking any HIV medication were also considered non-adherent.

**Demographic Variables.** Yearly income was assessed categorically in four levels: less than $15,000; $15,000-$30,000; $30,001-$60,000; and greater than $60,000. Education was assessed by self-report and levels were categorized by less than a high school diploma; high school graduate; some college; college graduate; some graduate school; and graduate degree. Primary health insurance was categorized as private; Medicaid; and other. Other demographic variables such as marital status, employment status, age (years), and length of time with an HIV positive status (years) were also assessed.
Data Analysis

Chi-square analysis was conducted to assess group comparisons between women who use dietary supplements and those who do not. Group comparisons were also analyzed using the Student’s t-test for continuous data. Additionally, descriptive statistics including means and standard deviations were obtained for all demographic and frequency data. Analyses were conducted using SPSS version 21.0.

RESULTS

A total of 153 HIV-positive Black women participated in the study. The mean age of the women was 49 years and the average time since HIV diagnosis was 13 (± 7.01) years. The majority of study participants had a high school education or better (80%), were single (84.3%), had a yearly income below $15,000 (83.1%), were unemployed (86.3%) and used Medicaid as their primary form of health insurance (76.5%). More than half (66%) of the study population contracted HIV through sexual activity, 13.7% in other ways (from birth or through intravenous drug use) and another 20.3% were not sure how they contracted the virus.

Just under half (45%) of the respondents used some form of dietary supplements. The types of dietary supplements used are presented in Table 5.1. Noni/Nona juice was the most frequently used (13.7 %) category followed by Ensure (11.1%), protein shakes (6.7%), Boost (2%) and other dietary supplements (1.3%). Another 10% were using two or more combinations of the dietary supplements listed above. Twenty-seven percent of the study population has been using dietary supplements for more than a year, while another 18% had been using dietary supplements for less than 6 months. When it comes to frequency of dietary supplements usage, 14.4% used it many times per week, 13.1%
used it every day, 13.7% used it on some occasions per month and 3.3% used it on some occasion per year. Lastly, 61% of women reported that they did not use dietary supplements before their HIV diagnosis, while 39% reported that they did.

For medication adherence, 60% of participants reported that they did not miss any HIV antiretroviral medications in the past 30 days; whereas 40% participants reported that they had missed their medications in the last 30 days. A chi-square analysis (Table 5.2) revealed that there was no difference in adherence between those who used dietary supplements (59%) and those who did not ($\chi^2 = 0.026, p = 0.871$). One demographic difference between users and nonusers was in age. Dietary supplements users were significantly older than nonusers (51.8 vs. 47.0, $p = 0.02$).

**DISCUSSION**

The purpose of this study was to explore dietary supplements use and medication adherence among HIV-positive Black women. About 45% of the study population reported using some type of dietary supplements to help treat their HIV infection. This finding is consistent with Evans and colleagues (1999) who reported that nutritional and dietary supplements are probably the most widely used complementary therapies in HIV and AIDS management.

Our bivariate analysis showed that there was no significant difference in HIV medication adherence between users and non-users of dietary supplements. This is consistent with the majority of studies showing no significant difference in adherence behaviors between users and non-users of alternative therapies among HIV-infected individuals (Bica et al., 2003; de Visser & Grierson, 2002; Knippels & Weiss, 2000; Risa et al., 2002; Wutoh et al., 2001) but contradicts the only other study with Black women.
which found that CAM use detracts from HIV medication adherence (Owen-Smith et al., 2007). Owen-Smith et al. (2007) found that women using immunity boosters or vitamins were 1.69 times more likely than nonusers to report missing HAART doses in the last 30 days. Our study also demonstrated that there were only one difference in demographic characteristics between users and non-users of dietary supplements. Age was found to be a significant characteristic with dietary supplement users being older in age compared to nonusers. Our findings suggest that using dietary supplements does not threaten HIV medication adherence; in fact those on dietary supplements had slightly better adherence compared to those who did not and this may suggest that those using CAM may be more proactive in their treatment decisions.

There were 61% percent of current dietary supplements users in our study who did engaged in dietary supplements behavior before their HIV diagnosis. Similarly, Fairfield and colleagues (1998) found that 70.9% of their sample started using dietary supplements after learning they were HIV positive. This finding suggests that an HIV diagnosis may facilitate the decision to initiate dietary supplements use.

There was one issue was of particular concern in our study. We found that of the 153 women participating in our study, 17% were not currently taking antiretroviral medication to treat their HIV. Of these women, 77% reported using some type of complementary and alternative medicine to treat their HIV. The remaining 23% of women not currently taking antiretroviral medication reported not using any type complementary and alternative medicine, suggesting that they made no attempt to treat their HIV.
While some of our study participants were adherent to their antiretroviral medications, many (45%) do indeed engage in CAM use. These findings are of concern to health care providers of HIV/AIDS patients, especially those serving Black women. Providers should assess CAM use as part of patients on going treatment, because of possible HIV drug interactions. An intervention by Slain et al. (2005) showed that high doses of vitamin C taken along with the HIV antiretroviral indinavir, led to reduced levels in plasma indinavir concentrations. A study by Piscitelli and associates (2000) found that if the commonly used antidepressant, St. John’s wort is taken with indinavir, reduced concentrations of indinavir can occur. The authors state that the results are important in HIV-infected patients taking these two medications because low plasma concentrations of protease inhibitors are a cause of antiretroviral resistance and treatment failure. A similar study found that use of St. John’s wort decreased concentration of the antiretroviral nevirapine (de Matt et al., 2001). Garlic also plays a role in interacting with HIV medication. Piscitelli and colleagues (2002) found that long-term use of garlic led to a significant ($p = 0.007$) decrease in the plasma concentrations of saquinavir.

According to Hsiao and colleagues (2003), one-third of their HIV positive study participants did not openly disclose their complementary and alternative medicine use with their health care provider. HIV health care providers should have a more open discussion with their patients about CAM use for treatment of HIV, since CAM use is occurring among HIV infected individuals. The National Center for Complementary and Alternative Medicine (NCCAM) has created a campaign entitled “Time to Talk about CAM: Healthcare Providers and Patients Need to Ask and Tell”. This campaign was developed to encourage patients and their health care providers to openly discuss the use
of CAM. In this campaign, patients have the responsibility of disclosing their CAM usage to their healthcare provider and in turn health care providers have the responsibility of asking their patients about any CAM usage. By having a more in-depth discussion about CAM, health care providers can offer advice that could help in minimizing the risk of using certain alternative therapies that may contraindicate with a patient’s HIV medication. Also, this exchange between provider and patient, allows the patient to be more proactive in managing their HIV care.

As a health care provider, it is important to know if HIV-infected individuals are utilizing CAM as an “alternative” rather than a “complement” with conventional HIV medication. Our findings highlight the notion that the field of medicine is changing with the incorporation of complementary and alternative medicine with biomedicine. This new emergence is being termed integrative medicine (Hollenberg & Muzzin, 2010). Most of the women in our study were using dietary supplements as a “complement” with their conventional HIV medications. These findings suggest that women in our study are not likely involved with a single treatment method and that this “integrative medicine method” on the part of the patient is important for HIV treatment and care. Conversely, 17% who were not taking their antiretrovirals at all, sought to use dietary supplements as an “alternative” to their HIV medication. If individuals want to use CAM as an alternative rather than a complement, they could be doing significant harm to themselves. If they start HAART medication, stop and then start using CAM, these individuals could possibly build resistance against their HIV medication, if they ever decide to initiate that antiretroviral treatment again (Rintamaki, Davis, Skripkauskas, Bennett, & Wolf, 2006).
A limitation of this study was that it was cross-sectional design and based on self-report although we simply sought to explore patterns of CAM and antiretroviral use and not its potential effect on health outcomes. Also, these results only apply to dietary supplements use as CAM and not other CAM therapies. Our results cannot be generalized to all HIV-infected women as we sought to better understand Black HIV-positive women. Although our findings are limited to California, women in different parts of the US may differ in their CAM use patterns. Additionally, this study included only English-speaking women who were physically able to participate in this study, and who were able to participate by completing a self-administered survey (although some were interviewed). Despite these limitations, our findings can be used to inform HIV health care professionals about CAM use among HIV positive Black women.

**CONCLUSION**

Our study showed that dietary supplements use was not associated with medication adherence in a sample of HIV positive Black women. Our findings further suggest that at least for Black HIV-positive women, CAM is a highly present reality, and needs to be better understood. Health care providers need to have open and non-judgmental discussions about CAM as part of a HIV person’s treatment interactions. Given the high levels of co-occurrence of CAM use among Black women who use antiretroviral medicine, further studies will need to explore how CAM use may affect health outcomes in this population; a population that experiences higher HIV mortality rates than many other groups.
Table 5.1 Prevalence of Dietary Supplements Usage (N = 153)

<table>
<thead>
<tr>
<th>Type</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Noni/Nona Juice</td>
<td>21</td>
<td>13.7%</td>
</tr>
<tr>
<td>Ensure</td>
<td>17</td>
<td>11.1%</td>
</tr>
<tr>
<td>Protein Shakes</td>
<td>10</td>
<td>6.5%</td>
</tr>
<tr>
<td>Boost</td>
<td>2</td>
<td>2%</td>
</tr>
<tr>
<td>Other</td>
<td>2</td>
<td>1.3%</td>
</tr>
<tr>
<td>2 types combinations</td>
<td>5</td>
<td>3.3%</td>
</tr>
<tr>
<td>3 types combinations</td>
<td>2</td>
<td>1.3%</td>
</tr>
<tr>
<td>4 type combinations</td>
<td>1</td>
<td>0.7%</td>
</tr>
<tr>
<td>No Usage</td>
<td>84</td>
<td>55%</td>
</tr>
<tr>
<td>Missing</td>
<td>8</td>
<td>5.2%</td>
</tr>
</tbody>
</table>
Table 5.2 Comparisons Between Users and Non-users of Dietary Supplements (N =153)

<table>
<thead>
<tr>
<th></th>
<th>Dietary Supplements users (n = 69)</th>
<th>Non-users (n = 84)</th>
<th>Test statistic</th>
<th>p (two-tailed)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years)</td>
<td>51.8 (9.61)</td>
<td>47.04 (8.89)</td>
<td>t = 3.18</td>
<td>0.002*</td>
</tr>
<tr>
<td>Length of time HIV positive (years)</td>
<td>12.71 (7.38)</td>
<td>12.8 (6.74)</td>
<td>t = -0.077</td>
<td>0.939</td>
</tr>
<tr>
<td>Education</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Less than a high school degree</td>
<td>20.3%</td>
<td>17.9%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>High school diploma or higher</td>
<td>79.7%</td>
<td>81%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Income (yearly)(^b)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Less than $15,000</td>
<td>82.6%</td>
<td>83.3%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Greater than $15,000</td>
<td>17.4%</td>
<td>16.7%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Employment</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Employed</td>
<td>11.6%</td>
<td>15.5%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unemployed</td>
<td>88.4%</td>
<td>84.5%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Health Insurance</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Medicaid</td>
<td>82.6%</td>
<td>71.4%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td>17.4%</td>
<td>28.6%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>HIV Medication Adherence (not missed antiretroviral in last 30 days)</td>
<td>59%</td>
<td>61%</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

\(^b\) Income excludes those with income less than $0.00.
REFERENCES


CHAPTER 6
THIRD PUBLISHABLE PAPER

Using the Theory of Planned Behavior to Explore Attitudes and Beliefs about Dietary Supplements among HIV-Positive Black Women

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ABSTRACT

Purpose. This study involved a cross-sectional design that used the Theory of Planned Behavior (TPB) to assess whether attitudes, subjective norms and perceived behavioral control were related to intention of dietary supplements use among Black women living with HIV/AIDS. Methods. A closed-ended questionnaire based on the TPB was utilized to explore dietary supplements use among a cohort of HIV-positive Black women. Data from 153 questionnaires were included in the analysis. Results: Overall, 45% percent of participants used dietary supplements to treat their HIV. Combined, attitudes, subjective norms, and perceived behavioral control were significant predictors of intention towards the behavior explaining 70% (p < 0.0001) of the variance in supplement use. Attitudes (β = 0.23, p < 0.001) and perceived behavioral control (β = 0.45, p < 0.001) were found to be significant independent predictors of intention; subjective norm was not. Behavioral intention, proximal TPB constructs (attitudes, subjective norms and perceived behavioral control), as well as their underlying beliefs about dietary supplements, were all found to be significantly more positive in users of dietary supplements compared to non-users (p < 0.001). Conclusion. The results of this study show that attitudes, subjective norms and perceived behavioral control are important predictors of intention to use dietary supplements for treatment of HIV among Black women. Implications from this study suggest that the TPB can be used to better identify and understand salient beliefs that surround intentions of alternative therapies which can be used to develop interventions surrounding HIV treatment and care.

Keywords: Dietary Supplements, Antiretroviral Treatments; African Americans; HIV/AIDS; Theory of Planned Behavior, Alternative Therapies
In this paper, we primarily use the term "Black" to refer to all individuals of African
descent, however, we also use the term African-American particularly when citing
published studies. Black and African American will be used interchangeably throughout
this paper.
INTRODUCTION

Blacks are severely impacted with new infections with HIV at an alarming rate. HIV infection remains a substantial problem for minority women, particularly among Black women. By the end of 2008, HIV was the third leading cause of death among Black women ages 35-44 in the U.S. (CDC, 2011). In 2009, Black women accounted for 30% of the estimated new HIV infections among all Blacks (CDC, 2011).

Current standard HIV treatment, referred to as highly active antiretroviral therapy (HAART), is a combination of HIV medications used to treat HIV. This antiretroviral therapy does not cure HIV, but it can lower the level of HIV in the body and prevent destruction of the immune system. To slow the progression of HIV to AIDS, a critical component of effective antiretroviral treatments is patient adherence (Merenstein et al., 2009). Death rates for HIV-infected people have dramatically decreased since the release of HAART in 1996 (Bhaskaran et al., 2008) with a 44% drop in deaths for the United States (Cheever, 1999). In addition to HAART, many infected persons consider the use of other methods to help them deal with HIV infection and/or the side effects of HAART itself. In general, patients who suffer from chronic illnesses turn to alternative medicines because of a desire to become more involved with their healthcare decisions and also because of dissatisfaction with conventional medications (Astin, 1998; Barnes, Powell-Griner, McFann, & Nahin, 2004).

Generally speaking, complementary and alternative medicine (CAM) is defined as a broad range of healing therapies and products (e.g., nutritional supplements, herbal remedies, acupuncture, meditation, prayer) that are currently not integrated with conventional medicine and are not widely taught in Western medical schools (Eisenberg
et al., 1993). The use of CAM among HIV/AIDS infected individuals has gained increasing popularity, with utilization rates estimated between 30-80% (Duggan, Peterson, Schutz, Khuder, & Charkraborty, 2001; Knippels & Weiss, 2000; Mikhail et al., 2004) depending on what is included in the definition of CAM. Research shows that HIV positive individuals frequently use acupuncture, message, meditation and herbs (Jernewall, Zea, Reisen & Poppen, 2005) as a source of HIV treatment. Greene et al. (1999) found that the most frequent CAM therapies used among HIV-infected populations were aerobic exercise (64%), prayer (56%), massage (54%), needle acupuncture (48%), breathing exercises (33%) and spiritual activities (33%). Another national study by Sparber et al. (2000) found certain CAM therapies that increased in use after an HIV diagnosis were imagery, high-dose vitamins, massages, herbal products, spiritual practices, acupuncture and exercise. Among HIV individuals, Risa and associates (2002) found that among HIV-infected individuals, new users of alternative therapies were significantly more likely to be Black. Kirksey et al. (2002) found that among HIV-infected individuals, 46% of Blacks used CAM more frequently, compared to 38% of Whites and 27% Latinos.

Dietary supplements have also been used as a type of CAM treatment among HIV-positive individuals. Dietary supplements provide energy and nutritional substances to the body to aid in preventing wasting syndrome. Severe anorexia and wasting syndrome are common illness in people with advanced stage HIV (Beal et al., 1995). AIDS wasting syndrome is the involuntary loss of more than 10% body weight. If not adequately treated, it can be life threatening. AIDS wasting syndrome can develop from poor appetite from HIV infection or HIV medication side effects, such as nausea,
diarrhea, and changes in taste; not absorbing nutrients well (HIV affects the intestinal lining); or changes in metabolism (HIV burns calories fast, so you need to take in more calories to maintain your body weight).

Scientifically, studies have shown that dietary supplements may have an effect on the HIV viral load as well as the CD$^+$ T-cells. A prospective randomized controlled trial by Kaiser et al. (2006) found that participants who were given a micronutrient supplement (that contain 33 ingredients) had a CD$^+$ T-cell count that significantly ($p = 0.029$) increased by 65 cells versus a 6-cell decline in the placebo group at the end of the 12-week intervention. The authors also noticed changes in HIV-1 RNA viral load level. There was a decrease in viral load in the micronutrient group although not significant ($p = 0.26$). Another randomized controlled study by Hurwitz et al. (2007) found that those in a selenium supplement intervention had significantly less viral load ($p<0.02$) and a greater CD$^+$ T-cell count increase ($p < 0.02$) when compared to the placebo group. Combined, these results show that dietary supplements may be effective in managing HIV/AIDS.

**Theoretical Model**

The theory of planned behavior (TPB) has been used to investigate a wide range of health related behaviors such as diet, physical activity and dietary supplements use (Conner, Kirk, Cade, & Barnett, 2001; Jemmott & Jemmott, 1991; Kassem, Lee, Modeste & Johnston, 2003; Pawlak et al., 2008; Rah, Hasler, Painter, & Chapman-Novakofski, 2004; Spink, Wilson, & Bostick, 2012; Wambach, 1998). This theory states that intentions toward a behavior are influenced by attitudes toward the behavior (positive or negative outcomes of the behavior), subjective norms (perceived social pressure to
engage or disengage in the behavior) and perceived behavioral control (perceived ability to perform the behavior; Ajzen, 1991). In this model, perceived behavioral control in addition to intention, are assumed to have a direct link towards the behavior. Attitudes, subjective norms and perceived behavioral (proximal TPB constructs) control are hypothesized to work together to determine intentions to act toward a behavior.

Ajzen’s Theory of Planned Behavior suggests that the three proximal constructs are influenced by underlying salient beliefs. The antecedent to attitudes, behavioral beliefs, links the behavior to a certain outcome that is likely either positive or negative (outcome evaluations). Normative beliefs are the likelihood that important social referents will approve or disapprove a given behavior and the motivation to comply with these social referents expectations (motivation to comply). Control beliefs (the antecedent to perceived behavioral control) are influenced by factors that increase or decrease the perceived difficulty of the behavior and the perceived power that these factors may inhibit or facilitate the behavior (power). High positive expectations, supportive normative beliefs and strong control beliefs influence a person’s behavioral intentions toward engaging in the behavior.

PURPOSE

The primary purpose of this study was to identify whether the theory of planned behavior (TPB) constructs are associated with dietary supplements use for treatment of HIV among Black women. We also sought to explore the differences in the proximal TPB constructs and their underlying belief composites (outcome evaluation, motivation to comply and power) between users and non-users of dietary supplements. Incorporating favorable attitudes and beliefs about dietary supplements into current HIV
treatment can be a small way to enhance care. Further inquiry is needed to establish support for the use of TPB as a framework for developing and implementing alternative therapy interventions in this population.

MATERIALS AND METHODS

Participants

We used a closed ended quantitative survey to elicit information from 153 HIV-positive Black women about dietary supplements use for treatment of their HIV-infection. Women who participated self-identified as Black or African American, had a HIV-positive diagnosis and was able to speak and read English. Women were also eligible if they were on antiretroviral therapy for 6 months or longer at any point in their lifetime. There were a total of 160 surveys collected from the study population. However, out of those 160 surveys, only 153 (95%) had useable data.

Procedure

Participants were recruited from various agencies around Southern and Northern California that provided HIV treatment and social services. A convenience sample using peer-to-peer referrals was utilized to recruit participants by posting fliers and via direct verbal solicitation by the researcher. Potential participants were screened for eligibility with a few questions regarding their ethnicity, age (over 18), HIV treatment and whether they were HIV-positive.

We developed a closed-ended survey from our previous qualitative study that explored salient beliefs (based on Ajzen’s 2003 TPB questionnaire) about complementary and alternative medicine use to treat HIV among Black women. We pilot tested the survey with 10 women (from the same target population as the inclusion criteria) to
assure readability, comprehension, relevancy of questions and appropriateness of length of time. Participant feedback of the instrument was obtained in a feedback focus group format after the women completed the surveys. The final survey was revised and prepared for distribution. The survey was self-administered to those who expressed that they had no difficulty with reading. For those who had difficulty, the survey was then administered by the researcher via interview style. A total of 160 surveys were collected; most (n =127 or 79.4%) in Southern California (Los Angeles, Riverside, and San Bernardino Counties) and 33 (20.6%) collected in Northern CA (Alameda County). The survey took about 20 minutes to complete and participants were given a small incentive ($10 gift card) for their time at the conclusion of the survey.

Measures

Theory of Planned Behavior (TPB) related items. All TPB related survey items were measured using a 7-point Likert response option scale (for example 1 = strongly disagree to 7 = strongly agree) for each of the constructs: attitudes, subjective norms, perceived behavioral control and intention (Ajzen & Fishbein, 1974; Ajzen, Timko, & White, 1982; Ajzen & Driver, 1991) of dietary supplements use to manage or control their HIV/AIDS. Dietary supplements use (yes/no) in the last 12 months was based on self-report.

Intention. Intention to use dietary supplements was assessed using three items: “During the next three months, I intend to regularly (at least twice a week) use dietary supplements to help control my HIV”; “During the next three months, I plan to use dietary supplements to help control my HIV”; and lastly “How likely is it that you will use dietary supplements to help control your HIV?” An item analysis was conducted to
determine the internal reliability among the intention statements. The Cronbach’s alpha for the three intention items was 0.96. All three of the intention items were averaged to create a mean score.

**Attitudes.** Attitudes were assessed by asking participants to respond to five items with bipolar adjectives for the following statements: “Overall, I think my taking dietary to treat my HIV is...” with the bipolar adjectives (on a 7-point Likert scale) being “favorable/unfavorable”, “pleasant/unpleasant, “harmful/beneficial” and “positive/negative”. The bipolar adjective “good/bad was also included to capture overall evaluation (Ajzen, 2006). The Cronbach’s alpha for the combined attitudes items was 0.86. All of the attitude variables were averaged to create a mean score.

**Subjective Norms.** Descriptive norms, or perceptions of how important others perform the behavior in question, were assessed by asking participants to respond to a set of three questions. Participants were asked to respond to the following statements: “Most HIV positive people like me are taking dietary supplements at least once a week to help control their HIV”; “Doing what other HIV positive women do is important to me”; and lastly “I feel under social pressure to use dietary supplements to help control my HIV.” Assessing injunctive norms, or whether others approve or disapprove of the behavior involved, was assessed by asking participants to respond to three statements: “Other HIV-positive women approve of my dietary supplements at least once a week to help control my HIV”; “People who are important to me would want me to take dietary supplements to treat my HIV”; and “Most people who are important to me approve of my taking dietary supplements to help control my HIV.” The Cronbach’s alpha for the
subjective norms items was 0.81. All of the subjective norms variables were averaged to create a mean score.

*Perceived Behavioral Control.* Perceived behavioral control was assessed by asking participants to respond to the following items: “I am confident that I can take dietary supplements at least once a week, for the next three months”; “Whether or not I take dietary supplements are entirely up to me”; “Taking dietary supplements to help control my HIV is...” The Cronbach’s alpha for perceived behavioral control items was below the recommended 0.70 score. If one variable from the corresponding set of perceived behavioral control were deleted, the Cronbach’s Alpha would then be increased to 0.80. Therefore, the item: “There are factors outside my control that could prevent me from taking dietary supplements to treat my HIV” was deleted from the item analysis and the other three variables were average to create a mean.

*Behavioral Beliefs and Outcome Evaluations.* Behavioral beliefs were assessed by asking the participants to respond to the following three statements: “My using dietary supplements at least once a month to treat my HIV will result in an increase in my T-cells”; “Taking dietary supplements at least once a month to treat my HIV would help my immune system”; and lastly “Using dietary supplements at least once a month to treat my HIV will give me more energy.” Outcome evaluations for each behavioral belief regarding dietary supplements use were assessed by asking participants to evaluate the outcome in each belief statement. Behavioral beliefs were then multiplied with a corresponding outcome evaluation and mean computed (Conner et al., 2001).

*Normative Beliefs and Motivation to Comply.* To assess normative beliefs, participants were asked to respond to three statements: “My [specific referent] thinks I
should/should not take dietary supplements”, where the blank was replaced with one of four referents: doctor, family or friends, and other HIV-positive women. Motivation to comply for each normative belief regarding dietary supplements use was assessed by asking participants to evaluate the motivation in each belief statement. Normative beliefs were then multiplied with a corresponding motivation to comply statement and mean computed (Conner et al., 2001).

**Control Beliefs and Power of Control.** Control beliefs were assessed by asking participants to respond to the following three statements: “Dietary supplements are expensive”; “Dietary supplements are not always available”; and “I am in control of my health when I take dietary supplements.” Power of control for each corresponding control belief was assessed by asking participants to evaluate their power in each statement. Control beliefs were then multiplied with a corresponding power belief and mean computed (Conner et al., 2001).

**Recent Dietary Supplements Use.** Recent experience using dietary supplements was assessed using one item that stated “In the past three months, I have used dietary supplements at least once a week to treat my HIV.” A seven-point bipolar scale, ranging from 1 (strongly disagree) to 7 (strongly agree) was used to measure the statement.

**Demographic Variables.** Yearly income was assessed by asking participants to self-report on various levels between $15,000 to $60,000. Education was assessed by self-report and levels were categorized by less than a high school diploma, high school graduate, some college, college graduate, some graduate school and graduate degree. Primary health insurance was categorized as private, Medicaid, and other. Other
demographic variables such as marital status, employment status, age (years), and length of time with an HIV positive status (years) were also assessed.

**Data Analysis**

All data were entered using the double entry method and then examined for missing data. Multiple linear regressions were conducted to examine the association between the proximal TPB constructs of attitudes, subjective norms and perceived behavior control on intention to use dietary supplements. Multiple linear regressions were also conducted to examine the association between proximal TPB constructs and their corresponding belief composites. Correlation among TPB related variables were analyzed using Spearman correlation coefficients. Descriptive statistics including means and standard deviation were obtained for all demographic and frequency data. Analyses were conducted using SPSS version 21.0.

**RESULTS**

**Descriptive Statistics**

A total of 153 HIV-positive Black provided usable data for this study. Demographic characteristics of the sample are presented in Table 6.1. The ages of the women ranged from 26 to 73 with a mean age of 49 years. The average length of time since first HIV diagnosis was 13 years. The majority of study participants had a high school education or better (80%), were single (84.3%), had a yearly income below $15,000 (83.1%), were unemployed (86.3%) and used Medicaid as their primary form of health insurance (76.5%). Forty-five percent of the sample used some form of dietary supplements. Noni/Nona juice was the most frequently used (13.7 %) category followed by Ensure (11.1%), protein shakes (6.7%), Boost (2%) and other dietary supplements...
(1.3%). Another 10% were using two or more combinations of the dietary supplements listed above.

**Comparison between users and non-users of dietary supplements**

Based on Mann-Whitney analysis, there were significant differences in intention, attitudes, subjective norms and perceived behavioral control mean scores between users and non-users of dietary supplements (Table 6.2). Those who used dietary supplements to treat their HIV had stronger intentions, significantly more positive attitudes towards use, had a higher perceived social pressure for use and a greater perceived control over the use compared to those who did not use dietary supplements to manage their condition.

For the three salient underlying beliefs, there were significant differences between the two groups. Users of dietary supplements had significant more positive perceived outcomes that may have promoted use. Conversely, nonusers had more negative perceived outcomes which may have deterred use. There was a significant difference in perceived social pressure, with users of dietary supplements having more positive social influence for use compared to nonusers. Users of dietary supplements had more positive control beliefs which may have facilitated use. However, non-users reported more negative control, in which factors may not have aided in facilitating use.

**Spearman Correlations**

Spearman correlation coefficients were produced to assess the relationship among all TPB related variables (Table 6.3). All TPB-related items were significantly ($p<0.0001$) positively correlated with intention (mean score) to use dietary supplements. In addition, TPB related items were all significantly correlated with each other. The
The strongest correlation was between recent behavior (past three months) of dietary supplements and behavioral intention, which is expected based on the theory. Because of this strong correlation, recent behavior was adjusted for in the multiple linear regression analyses.

**Association of TPB Constructs and Behavioral Intention**

Linear regressions were conducted to test whether attitudes, subjective norms, and perceived behavioral control was associated with intention to use dietary supplements to treat HIV, after controlling for recent dietary supplements use behavior. Attitudes, subjective norms and perceived behavioral control were included in separate univariate regression models to predict intention, controlling for recent use (Table 6.4). Attitudes explained 58% of the variance for intention when adjusting for recent dietary supplements behavior \( F(2, 150) = 105.83, p < 0.0001 \). Subjective norms also explained 58% of the variance for intention when adjusting for recent dietary behavior use \( F(2, 150) = 106.38, p < 0.0001 \). Perceived behavioral control explained 66% of the variance in intention when adjusting recent dietary supplements use \( F(2, 150) = 150.65, p < 0.0001 \).

Next, attitudes, subjective norms and perceived behavioral control were all placed together in a multiple regression model to see if they independently and together predicted intentions to use dietary supplements. Age, recent dietary supplements use and amount of time HIV-positive were placed in the model as control variables, in addition to current dietary supplements use. The regression analysis revealed that the total model accounted for 69% of the variance in intention \( F(7, 145) = 49.17, p < 0.0001 \). However, only attitudes and perceived behavioral control were found to be significant.
independent predictors of intention, with perceived behavioral control having greatest influence. There was no appreciable increase in R² value beyond perceived behavioral control alone, after controlling for recent behavior and demographics. Age was also found to be a significant (p = 0.009) predictor to use dietary supplements. Therefore, the older the person was, the stronger the intention to use dietary supplements is.

**Links Between Proximal TPB Constructs and Belief Composites**

Multiple linear regressions were also conducted on the proximal TPB variables (attitudes, subjective norms, and perceived behavioral control) on their individual belief composite variables (Table 6.5). The regression analysis showed that they combination of the three behavioral beliefs (BE x OE) composite variables predicted attitude scores, together accounting for 23% of the variance in attitudes \([F(3, 149) = 15.68, p < 0.0001]\). However, only composite variable number 1 (My using dietary supplements at least once to help control my HIV is entirely up to me) was found to be a significant independent predictor of attitudes. The combination of all three normative belief composites variables (NB x MC) accounted for 52% of the variance in subjective norms \([F(4, 148) = 41.95, p < 0.0001]\). All of the composite variables with exception of composite variable number 2 (My family thinks I should not/should use dietary supplements at least once a month to treat my HIV) significantly and independently predicted subjective norms. For perceived behavioral control, the combination of the antecedent composites (CP x P) accounted for 42% of the variance in perceived behavioral control \([F(4, 149) = 37.72, p < 0.0001]\). All of the composite variables significantly and independently predicted perceived behavioral control.
DISCUSSION AND CONCLUSION

Our research supports the use of the theory of planned behavior in understanding dietary supplements use for treatment of HIV. Our findings suggest that there is a range of salient beliefs that distinguish those who use and do not use dietary supplements. Not surprisingly, intentions or the plan to use dietary supplements in the next three months, were significantly more positive for those who were users of dietary supplements compared to non-users. Our findings are consistent with Conner and colleagues (2001) who found that stronger intentions exist in dietary supplements users compared to non-users. In our study, we also found that users of dietary supplements had more positive attitudes than nonusers. Women wanting a sense of control over their HIV treatment as well as seeking relief from HIV medication side effects may have contributed to users having more perceived positive beliefs in supplement. Similarly George, Birck, Hufford, Jemmott, and Weaver (2006) found that factors such as wanting a natural approach to medicine, obtaining symptom relief, and offering hope for a cure promoted positive attitudes of CAM use for the treatment of asthma in Blacks. Perceived social influences (doctor, family, friends and other HIV-positive women) to use dietary supplements were found to be significantly more positive in users of dietary supplements compared to non-users in this study. Kaufman and Gregory (2007) found similar results in their study. The authors discovered that among participants, the decision to use CAM was associated with their social network. Perceived behavioral control, as well as control beliefs, was found to be more positive among users of dietary supplements in our sample. Understanding beliefs using the TPB can therefore be important in investigating CAM use and targeting HIV treatment strategies.
Consistent with the theory of planned behavior (Ajzen, 1991), the three proximal TPB constructs (attitudes, subjective norms and perceived behavioral control) were all found to significantly predict behavioral intentions of dietary supplements use. However, when placed together, only attitudes and perceived behavioral control were found to be significant independent predictor of intention to use dietary supplements. Therefore, stronger intentions to use dietary supplements to treat HIV were associated with having positive attitudes towards dietary supplements as well as greater perceived control over use, even after controlling for all other variables in the model. Our findings are inconsistent with Furham and Lovett (2001) who found that stronger intentions of homeopathy were associated with more positive attitudes, more perceived pressure, as well as increased control over the use of homeopathy.

Among HIV-positive individuals, research shows that the relief of side effects and the increase in quality of life are factors that promote positive attitudes of CAM use among certain populations of HIV-infected individuals (Chang, van Servellen, & Lombardi, 2003; Hsiao et al., 2003). Such finding suggests that CAM does have a positive effect on health and that patients seek alternative medicines to aid in alleviating their HIV medication side effects. As stated earlier, attitudes remained as an independent significant independent predictor of intention of dietary supplements use. Our findings were consistent to Chen and colleagues (2009) who reported that some of their HIV participants held positive attitudes towards CAM because of their positive experiences with the alternative medicine. When placed in the regression model with other proximal TPB constructs, subjective norms was not a significant independent predictor of intention to use dietary supplements, suggesting that perceived social influence to use dietary
supplements does not play a major role in intention to use dietary supplements. Conversely, Kelner and Wellman (1997) found that social relations play an important role in providing information to patients seeking alternative therapy. Sixty-two percent of this study’s participants found an alternative practitioner through someone in their social network. Ethnic differences and cultural influence may have played a role in decision to use alternative medicine. Specifically among minority women (Mexican, Black and Chinese) Chao, Wade, Kronenberg, Kalmuss, and Cushman (2006) found CAM use by family members influenced a person’s reason to use CAM. About 40% of the women in our current study belonged to HIV-positive women support groups in which discussions about alternative forms of treatment may have been discussed amongst the women, therefore influencing their positive attitudes and beliefs about dietary supplements use. In our study, intentions were most strongly predicted by perceived behavioral control towards dietary supplements use. Studies have shown that those who use CAM do so because it makes them feel as though they are in control of their treatment (Foote-Ardah, 2003; Furham & Forey, 1994; Furham & Lovett, 2001).

This study provides important information about attitudes, subjective norms, perceived behavioral control and underlying beliefs for dietary supplements use for treatment of HIV. An important limitation is that this study was a cross-sectional design, thereby limiting our certainty about cause and effect between dietary supplements use and other independent variables. Another limitation is that the results cannot be generalized to all HIV-infected women because the participants of this study were only Blacks. Additionally, this study included only English-speaking women who were physically able to participate in this study, and who were able to complete a self-
administered survey (i.e. thus they must have sufficient reading and comprehension skills to complete the survey). The last limitation is that data are dependent upon respondent’s self-report, (i.e. accuracy as well as knowledge) of dietary supplements use and/or their willingness to report use accurately.
Table 6.1 Demographic Characteristics (N = 153)

<table>
<thead>
<tr>
<th></th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Education</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Less than a high school degree</td>
<td>29</td>
<td>19%</td>
</tr>
<tr>
<td>High school degree</td>
<td>54</td>
<td>35%</td>
</tr>
<tr>
<td>Some college</td>
<td>45</td>
<td>29%</td>
</tr>
<tr>
<td>College Degree</td>
<td>19</td>
<td>12%</td>
</tr>
<tr>
<td>Graduate degree</td>
<td>5</td>
<td>3%</td>
</tr>
<tr>
<td><strong>Married</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Single</td>
<td>85</td>
<td>56%</td>
</tr>
<tr>
<td>Divorced/Separated</td>
<td>33</td>
<td>22%</td>
</tr>
<tr>
<td>Widowed</td>
<td>11</td>
<td>7%</td>
</tr>
<tr>
<td>Partnered</td>
<td>11</td>
<td>7%</td>
</tr>
<tr>
<td>Married</td>
<td>13</td>
<td>9%</td>
</tr>
<tr>
<td><strong>Annual Income</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Less than $15,000</td>
<td>127</td>
<td>83%</td>
</tr>
<tr>
<td>$15,000-$30,000</td>
<td>19</td>
<td>12%</td>
</tr>
<tr>
<td>$30,001-$60,000</td>
<td>5</td>
<td>3%</td>
</tr>
<tr>
<td>More than $60,000</td>
<td>2</td>
<td>1%</td>
</tr>
<tr>
<td><strong>Employment</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Working</td>
<td>21</td>
<td>14%</td>
</tr>
<tr>
<td>Not Working</td>
<td>132</td>
<td>86%</td>
</tr>
<tr>
<td><strong>Health Insurance</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Medicare/Medicaid</td>
<td>117</td>
<td>76.5</td>
</tr>
<tr>
<td>Other</td>
<td>36</td>
<td>24%</td>
</tr>
<tr>
<td><strong>Age (years)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>49.18 ± 9.5</td>
</tr>
<tr>
<td><strong>Number of years since HIV</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>diagnosis</td>
<td></td>
<td>13.76 ± 7.0</td>
</tr>
</tbody>
</table>
Table 6.2 Comparison of TPB Variables Between Dietary Supplements Users and Nonusers (median)\(^a\) (N = 153)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Users (n = 69)</th>
<th>Non-users (n = 84)</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intentions</td>
<td>6</td>
<td>1.50</td>
<td>(p &lt; 0.001)</td>
</tr>
<tr>
<td>Attitudes</td>
<td>5.80</td>
<td>4.60</td>
<td>(p &lt; 0.001)</td>
</tr>
<tr>
<td>Behavioral Beliefs Composite (BB x OE)</td>
<td>42</td>
<td>28</td>
<td>(p &lt; 0.001)</td>
</tr>
<tr>
<td>Subjective Norms</td>
<td>4.83</td>
<td>3.75</td>
<td>(p &lt; 0.001)</td>
</tr>
<tr>
<td>Normative Beliefs Composite (NB x MC)</td>
<td>27.25</td>
<td>16</td>
<td>(p &lt; 0.001)</td>
</tr>
<tr>
<td>Perceived Behavioral Control Beliefs Composite (CB x P)</td>
<td>6.33</td>
<td>4.67</td>
<td>(p &lt; 0.001)</td>
</tr>
<tr>
<td></td>
<td>23.67</td>
<td>18.83</td>
<td>(p &lt; 0.001)</td>
</tr>
</tbody>
</table>

\(^a\)Mann Whitney Test between users and non-users.
Table 6.3 Correlation Among TPB-Related Variables\(^a\) (N= 153)

<table>
<thead>
<tr>
<th></th>
<th>ATT</th>
<th>BB x OE</th>
<th>SN</th>
<th>NB x MC</th>
<th>PBC</th>
<th>CB x P</th>
<th>BI</th>
</tr>
</thead>
<tbody>
<tr>
<td>ATT</td>
<td>1.000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BB x OE</td>
<td>0.472</td>
<td>0.617</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SN</td>
<td>0.438</td>
<td>0.647</td>
<td>0.715</td>
<td>0.588</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NB x MC</td>
<td>0.406</td>
<td>0.647</td>
<td>0.715</td>
<td>0.588</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PBC</td>
<td>0.491</td>
<td>0.774</td>
<td>0.639</td>
<td>0.588</td>
<td>0.335</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CB x P</td>
<td>0.254</td>
<td>0.522</td>
<td>0.448</td>
<td>0.475</td>
<td>0.335</td>
<td>0.384</td>
<td></td>
</tr>
<tr>
<td>BI</td>
<td>0.481</td>
<td>0.602</td>
<td>0.600</td>
<td>0.583</td>
<td>0.686</td>
<td>0.384</td>
<td>0.718</td>
</tr>
<tr>
<td>Recent Behavior</td>
<td>0.257</td>
<td>0.425</td>
<td>0.491</td>
<td>0.501</td>
<td>0.399</td>
<td>0.331</td>
<td>0.718</td>
</tr>
</tbody>
</table>

\(^a\)Spearman’s correlation coefficients are all significant (p < 0.0001). ATT = attitudes; BB x OE = composite score of behavioral beliefs multiplied by outcome evaluations; SN = subjective norms; NB x MC = composite score of normative beliefs multiplied by normative beliefs; PBC = perceived behavioral control; CB x P = composite score of control beliefs multiplied by power; BI = behavioral intention.
Table 6.4 Linear Regressions of Intention to Use Dietary Supplements on Attitudes, Subjective Norms and Perceived Behavioral Control\(^a\) (N = 153)

<table>
<thead>
<tr>
<th>Step 1</th>
<th>B</th>
<th>SE</th>
<th>Significance</th>
<th>Adjusted R²</th>
<th>Significance of Adjusted R²</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Attitudes</strong></td>
<td>0.42</td>
<td>0.07</td>
<td>(p &lt; 0.001)</td>
<td>0.580</td>
<td>(p &lt; 0.001)</td>
</tr>
<tr>
<td><strong>Recent Behavior</strong></td>
<td>0.56</td>
<td>0.05</td>
<td>(p &lt; 0.001)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Subjective Norms</strong></td>
<td>0.50</td>
<td>0.09</td>
<td>(p &lt; 0.001)</td>
<td>0.581</td>
<td>(p &lt; 0.001)</td>
</tr>
<tr>
<td><strong>Recent Behavior</strong></td>
<td>0.47</td>
<td>0.05</td>
<td>(p &lt; 0.001)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Perceived Behavioral Control</strong></td>
<td>0.56</td>
<td>0.06</td>
<td>(p &lt; 0.001)</td>
<td>0.667</td>
<td>(p &lt; 0.001)</td>
</tr>
<tr>
<td><strong>Recent Behavior</strong></td>
<td>0.48</td>
<td>0.05</td>
<td>(p &lt; 0.001)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Step 2</th>
<th>B</th>
<th>SE</th>
<th>Significance</th>
<th>Adjusted R²</th>
<th>Significance of Adjusted R²</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Attitudes</strong></td>
<td>0.23</td>
<td>0.07</td>
<td>(p &lt; 0.001)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Subjective Norms</strong></td>
<td>0.05</td>
<td>0.10</td>
<td>(p = 0.58)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Perceived Behavioral Control</strong></td>
<td>0.45</td>
<td>0.08</td>
<td>(p &lt; 0.001)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Current Behavior</strong></td>
<td>0.45</td>
<td>0.05</td>
<td>(p &lt; 0.001)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Age</strong></td>
<td>0.02</td>
<td>0.01</td>
<td>(p = 0.09)</td>
<td>0.689</td>
<td>(p &lt; 0.001)</td>
</tr>
<tr>
<td><strong>Income (Less than $15,000/year)</strong></td>
<td>0.30</td>
<td>0.29</td>
<td>(p = 0.31)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Length of time HIV positive (years)</strong></td>
<td>-0.32</td>
<td>0.23</td>
<td>(p = 0.15)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

\(^a\) B = regression coefficient; SE = standard error
### Table 6.5 Linear Regressions of Proximal TPB Constructs Onto Individual Belief Composites

<table>
<thead>
<tr>
<th>Variable</th>
<th>B</th>
<th>SE</th>
<th>Significance</th>
<th>Adjusted R²</th>
<th>Significance of Adjusted R²</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Beliefs</strong>&lt;sup&gt;a&lt;/sup&gt;</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intercept</td>
<td>3.24</td>
<td>0.29</td>
<td>&lt;.0001</td>
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<td></td>
</tr>
<tr>
<td>Increase in T-cells</td>
<td>BB x OE 1</td>
<td>0.06</td>
<td>0.02</td>
<td>0.0002</td>
<td></td>
</tr>
<tr>
<td>Help my immune system</td>
<td>BB x OE 2</td>
<td>0.01</td>
<td>0.01</td>
<td>0.6148</td>
<td>0.225</td>
</tr>
<tr>
<td>Give me more energy</td>
<td>BB x OE 3</td>
<td>-0.01</td>
<td>0.01</td>
<td>0.3438</td>
<td></td>
</tr>
<tr>
<td><strong>Normative</strong>&lt;sup&gt;b&lt;/sup&gt;</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intercept</td>
<td>2.02</td>
<td>0.19</td>
<td>&lt;.0001</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Doctor</td>
<td>NM x MC 1</td>
<td>0.03</td>
<td>0.01</td>
<td>0.0004</td>
<td>0.519</td>
</tr>
<tr>
<td>Family</td>
<td>NM x MC 2</td>
<td>0.01</td>
<td>0.01</td>
<td>0.1268</td>
<td></td>
</tr>
<tr>
<td>Friends</td>
<td>NM x MC 3</td>
<td>0.02</td>
<td>0.01</td>
<td>0.0333</td>
<td></td>
</tr>
<tr>
<td><strong>Control</strong>&lt;sup&gt;c&lt;/sup&gt;</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intercept</td>
<td>3.21</td>
<td>0.24</td>
<td>&lt;.0001</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Expensive</td>
<td>Cont x PC1</td>
<td>0.03</td>
<td>0.01</td>
<td>0.0104</td>
<td></td>
</tr>
<tr>
<td>Not available</td>
<td>Cont x PC2</td>
<td>-0.03</td>
<td>0.01</td>
<td>0.0048</td>
<td>0.420</td>
</tr>
<tr>
<td>Feeling of control</td>
<td>Cont x PC3</td>
<td>0.07</td>
<td>0.01</td>
<td>&lt;.0001</td>
<td></td>
</tr>
</tbody>
</table>

<sup>a</sup> Dependent Variable = Mean Attitudes;<sup>b</sup> Dependent Variable = Mean Subjective Norms;<sup>c</sup> Dependent Variable = Mean Perceived Behavioral Control
REFERENCES


CHAPTER 7
ADDITIONAL FINDINGS

Further analyses were performed to assess HIV medication adherence among those who used and did not use spiritual practices for treatment of HIV. Other analyses included investigating the association between TPB related variables and spiritual practices. Specifically, attitudes, subjective norms and perceived behavioral control were assessed to determine if these proximal items were related to intention of spiritual practices use. Research shows that prayer is more likely to be considered a daily activity among African Americans. Taylor, Chatters, and Levin (2004) state that close to 80% of Black Americans reported that they pray nearly every day. In regards to gender and prayer activities, the National Survey of Black Americans showed that 84% of Black women pray nearly every day compared to only 68% of Black men (Taylor et al., 2004). It is important to investigate medication adherence and the relationship between TPB proximal variables and intention of spiritual practices use, as they may useful when developing HIV treatment interventions among Black women.

RESULTS

Descriptive Statistics

A total of 153 HIV-positive Black women were recruited to participate in this cross-sectional study that explored spiritual practices use and TPB related variables. Demographic characteristics of the sample are presented in Table 7.1. The ages of the women ranged from 26 to 73 with a mean age of 49 years. The average length of time since first HIV diagnosis was 13 years. The majority of study participants had a high school education or better (80%), were single (84.3%), had a yearly income below
$15,000 (83.1%), were unemployed (86.3%) and used Medicaid as their primary form of health insurance (76.5%).

Seventy percent of the study sample used spiritual practices as a form of complementary and alternative medicine to treat their HIV. For those using spiritual practices to treat their HIV, 60% were using it for more than one year. When it comes to how often spiritual practices is used, 6% of the sample uses it sometimes per month, 15% use it many occasions per week and 48% use it every day. An analysis investigating if spiritual practices use preceded an HIV diagnosis found that 58% of the women in our sample used spiritual practices/prayer before they were diagnosed with HIV.

**HIV Medication Adherence**

For HIV medication adherence, in those currently using spiritual practices, 38% were adherent to their medication in the last 30 days, while 62% were not adherent. For those not currently using spiritual practices, 43% were adherent to their HIV medication in the last 30 days while 67% were not. Despite these trends, a Chi Squared analysis showed that there was no significant difference in adherence between those who were users and nonusers of spiritual practices ($\chi^2 = 0.357, p = 0.550$). This result was most likely due to the small sample size resulting in poor power for this particular analysis.

**Spearman Correlations**

Spearmen correlation coefficients were produced to assess the relationship among all TPB related variables (Table 7.2). Our analysis showed that all of the TPB-related items (mean scores of attitudes, subjective norms, perceived behavioral control, behavioral beliefs, normative beliefs, control beliefs, recent spiritual practices use behavior) were significantly ($p < 0.0001$) positively correlated with intention (mean score)
to spiritual practices use. Attitudes were not significantly correlated with either subjective norms or its composite score. There was a strong correlation between recent behavior of spiritual practices and behavioral intention, which is to be expected according to the theory. Because of this strong correlation, recent behavior was controlled for when conducting the multiple linear regression analyses.

**TPB Constructs and Behavioral Intention**

Linear regressions were conducted to see whether attitudes, subjective norms, and perceived behavioral control was associated with intention to use spiritual practices to treat HIV, after controlling for recent spiritual practices behavior. Attitudes, subjective norms and perceived behavioral control were first separately placed in a univariate regression model to predict intention, controlling for recent use (Table 7.3). Attitudes explained 68% of the variance for intention when adjusting for recent spiritual practices behavior \(F(2, 150) = 156.42, p < 0.0001\). Subjective norms explained 71% of the variance for intention when adjusting for recent spiritual practices behavior \(F(2, 150) = 188.35, p < 0.0001\). Perceived behavioral control explained 76% of the variance in intention when adjusting recent spiritual practices behavior \(F(2, 150) = 241.04, p < 0.0001\).

Next, attitudes, subjective norms and perceived behavioral control were all place in a multiple regression model to see if they continued to predict intentions to use spiritual practices. Age, recent spiritual practices use and amount of time HIV-positive were placed in the model as control variables. The regression analysis showed that the model overall accounted for 77% of the variance in intention \(F(4, 148) = 129.18, p < 0.0001\). All TPB proximal variables were all found to be significant independent
predictors of intention, with perceived behavioral control having greatest influence. There was no appreciable increase in R² value beyond perceived behavioral control alone, after controlling for recent behavior and demographics.

**DISCUSSION AND CONCLUSION**

One of the aims of this study was to investigate HIV medication adherence among those who were users and nonusers of spiritual practices. This study also aimed to explore the use of the TPB in the context of spiritual practices use among HIV-positive Black women. Research shows that spiritual activities such as church attendance and prayer are commonly used among African Americans (Graham et al., 2005; Martin, 1984; Taylor, Chatters, & Levin, 2004). Religious activities have also been researched among HIV populations. Specifically to HIV Black women, Dalmida, Holstad, DiLorio and Laderman (2012) found that spirituality had a positive impact on the mental and physical health and overall quality of life. Looking at our present study, a majority (70%) of the women in this study used spiritual practices to “treat” their HIV. Our findings are consistent with Kaplan et al. (1997) who showed that prayer was the highest coping response for HIV-positive women, especially among Black women with HIV.

Our bivariate analysis showed that there was no significant difference in HIV medication adherence between users (70%) and non-users (30%) of spiritual practices. This is consistent with the majority of published findings that found no significant difference in adherence behaviors between users and non-users of alternative therapies among HIV-infected individuals (Bica et al., 2003; de Visser & Grierson, 2002; Knippels & Weiss, 2000; Risa et al., 2002; Wutoh et al., 2001) but contradicts the only other study with Black women in which authors found that alternative therapy use distracts from HIV.
medication adherence (Owen-Smith et al., 2007). Our findings suggest that if there is an effect at all, data directly point to a protective effect but since this is not significant, we can clearly state that this alternative therapy did not have a detrimental effect and did not threaten HIV medication adherence. Using spiritual practices has found to be a protective factor among HIV positive individuals not taking HIV medication. For example, Fitzpatrick and colleagues (2007) explored how the involvement in spiritual activities (e.g., prayer, meditation, affirmation, psychic healing and visualizations) was associated with survival in HIV infected patients. The authors found that among participants who were not taking HAART, those involved in spiritual practices for over a year, were found to be at reduced risk of death or have longer survival rates compared to those who those who did not engage in any spiritual activities. This association was not present in participants who were taking HAART.

Consistent with the theory of planned behavior (Ajzen, 1991), all three proximal TPB constructs (attitudes, subjective norms and perceived behavioral control) were all found to significantly predict behavioral intentions of spiritual practices use. When placed in a univariate model, attitudes explained 68% of the variance in intention to use spiritual practices which suggests that the more positive attitudes towards the behavior, the more likely one will engage in the behavior. Subjective norms alone, accounted for 71% of the variance intention. This finding suggests that the women could be influenced by their social network. Thus, if the women’s’ social network supports the spiritual practices behavior, the women will be more likely to perform this behavior. This is consistent with Kaufman and Gregory (2007) who found that alternative medicine use was associated with agreement from a person’s social network. Studies have shown that
those who use CAM do so because it makes them feel as though they are in control of their treatment (Foote-Ardah, 2003; Furham & Forey, 1994; Furham & Lovett, 2001). In our study, perceived behavioral control explained 76% of the variance in intention. Intentions were most strongly predicted by perceived behavioral control towards to use spiritual practices use. In this study, the content of perceived behavioral control might have represented convenience (i.e. control, and cost) and resulted in a direct influence on behavioral intention.

Results highlighted the importance of the TPB proximal variables in investigating spiritual practices; having predicted 77% of the variance in intention to use spiritual practices for treatment of HIV. Our findings suggests that stronger intentions to use spiritual practices to treat HIV are associated with having more positive attitudes, higher supportive referents towards the behavior as well as greater perceived control over use. This finding is consistent with numerous health behavior studies that used the TPB and found attitudes, subjective norm and perceived behavioral control to be significant predictors of intention (Godin & Kok, 1996). Similarly, Furham and Lovett (2001) found that stronger intentions of alternative therapy were associated with more positive attitudes, more perceived social pressure, and increased control over the use of homeopathy.

In conclusion, we find that using the TPB as a framework adds to the limited research to explore alternative medicine behavior in HIV-positive Black women. For the women, incorporating favorable spiritual practice attitudes and beliefs into their HIV treatment can be a way to enhance care. Further inquiry is needed to establish support for
the use of the TPB as a framework for developing and implementing alternative therapy interventions in this population.
Table 7.1 Demographic Characteristics (N = 153)

<table>
<thead>
<tr>
<th></th>
<th>Frequency</th>
<th>Percent</th>
<th>Mean ± SD</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Education</strong></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Less than a high school degree</td>
<td>29</td>
<td>19%</td>
<td></td>
</tr>
<tr>
<td>High school degree</td>
<td>54</td>
<td>35%</td>
<td></td>
</tr>
<tr>
<td>Some college</td>
<td>45</td>
<td>29%</td>
<td></td>
</tr>
<tr>
<td>College Degree</td>
<td>19</td>
<td>12%</td>
<td></td>
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<tr>
<td>Graduate degree</td>
<td>5</td>
<td>3%</td>
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</tr>
<tr>
<td><strong>Married</strong></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Single</td>
<td>85</td>
<td>56%</td>
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<td>Divorced/Separated</td>
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<td>22%</td>
<td></td>
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<tr>
<td>Widowed</td>
<td>11</td>
<td>7%</td>
<td></td>
</tr>
<tr>
<td>Partnered</td>
<td>11</td>
<td>7%</td>
<td></td>
</tr>
<tr>
<td>Married</td>
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<td><strong>Annual Income</strong></td>
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<tr>
<td>Less than $15,000</td>
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<td>83%</td>
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<td>$15,000-$30,000</td>
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<td>$30,001-$60,000</td>
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<td>Working</td>
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<tr>
<td>Not Working</td>
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<td>86%</td>
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<td><strong>Health Insurance</strong></td>
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<td>Medicare/Medicaid</td>
<td>117</td>
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<tr>
<td>Other</td>
<td>36</td>
<td>24%</td>
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<tr>
<td><strong>Age (years)</strong></td>
<td></td>
<td>49.18 ± 9.5</td>
<td></td>
</tr>
<tr>
<td><strong>Number of years since HIV diagnosis</strong></td>
<td>134</td>
<td>13.76 ± 7.0</td>
<td></td>
</tr>
<tr>
<td></td>
<td>ATT</td>
<td>BB x OE</td>
<td>SN</td>
</tr>
<tr>
<td>-------</td>
<td>--------</td>
<td>---------</td>
<td>-------</td>
</tr>
<tr>
<td>ATT</td>
<td>1.000</td>
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<td></td>
</tr>
<tr>
<td>BB x OE</td>
<td>0.415</td>
<td></td>
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</tr>
<tr>
<td>SN</td>
<td>0.141*</td>
<td>0.577</td>
<td></td>
</tr>
<tr>
<td>NB x MC</td>
<td>0.040*</td>
<td>0.544</td>
<td>0.654</td>
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<tr>
<td>PBC</td>
<td>0.426</td>
<td>0.756</td>
<td>0.618</td>
</tr>
<tr>
<td>CB x P</td>
<td>0.316</td>
<td>0.687</td>
<td>0.560</td>
</tr>
<tr>
<td>BI</td>
<td>0.451</td>
<td>0.613</td>
<td>0.522</td>
</tr>
<tr>
<td>Recent Behavior</td>
<td>0.323</td>
<td>0.484</td>
<td>0.422</td>
</tr>
</tbody>
</table>

*Spearman’s correlation coefficients are all significant (*p < 0.0001*). ATT = attitudes; BB x OE = composite score of behavioral beliefs multiplied by outcome evaluations; SN = subjective norms; NB x MC = composite score of normative beliefs multiplied by normative beliefs; PBC = perceived behavioral control; CB x P = composite score of control beliefs multiplied by power; BI = behavioral intention. *Not significant
Table 7.3 Linear Regression of Intention to Use Spiritual Practices on Attitudes, Subjective Norms and Perceived Behavioral Control\(^a\) (N = 153)

<table>
<thead>
<tr>
<th>Step 1</th>
<th></th>
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<th>Significance</th>
<th>Adjusted R(^2)</th>
<th>Significance of Adjusted R(^2)</th>
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<tr>
<td></td>
<td>(B)</td>
<td>SE</td>
<td></td>
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<tr>
<td>Attitudes</td>
<td>0.27</td>
<td>0.07</td>
<td>(p &lt; 0.001)</td>
<td>0.672</td>
<td>(p &lt; 0.001)</td>
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<tr>
<td>Recent Behavior</td>
<td>0.68</td>
<td>0.04</td>
<td>(p &lt; 0.001)</td>
<td></td>
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</tr>
<tr>
<td>Subjective Norms</td>
<td>0.42</td>
<td>0.07</td>
<td>(p &lt; 0.001)</td>
<td>0.711</td>
<td>(p &lt; 0.001)</td>
</tr>
<tr>
<td>Recent Behavior</td>
<td>0.58</td>
<td>0.05</td>
<td>(p &lt; 0.001)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Perceived Behavioral Control</td>
<td>0.54</td>
<td>0.06</td>
<td>(p &lt; 0.001)</td>
<td>0.760</td>
<td>(p &lt; 0.001)</td>
</tr>
<tr>
<td>Recent Behavior</td>
<td>0.49</td>
<td>0.04</td>
<td>(p &lt; 0.001)</td>
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<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Step 2</th>
<th></th>
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<th>Adjusted R(^2)</th>
<th>Significance of Adjusted R(^2)</th>
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<tr>
<td></td>
<td>(B)</td>
<td>SE</td>
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<tr>
<td>Attitudes</td>
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<td>0.06</td>
<td>(p &lt; 0.001)</td>
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<td>Subjective Norms</td>
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<td>0.08</td>
<td>(p = 0.58)</td>
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<tr>
<td>Perceived Behavioral Control</td>
<td>0.39</td>
<td>0.08</td>
<td>(p &lt; 0.001)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Recent Behavior</td>
<td>0.47</td>
<td>0.05</td>
<td>(p &lt; 0.001)</td>
<td></td>
<td></td>
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<tr>
<td>Age</td>
<td>0.01</td>
<td>0.01</td>
<td>(p = 0.09)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Income (Less than $15,000/year)</td>
<td>-0.08</td>
<td>0.29</td>
<td>(p = 0.31)</td>
<td>0.767</td>
<td>(p &lt; 0.001)</td>
</tr>
<tr>
<td>Length of time HIV positive (years)</td>
<td>-0.01</td>
<td>0.18</td>
<td>(p = 0.15)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

\(^a\)\(B\) = regression coefficient; SE = standard error
CHAPTER 8

CONCLUSIONS AND RECOMMENDATIONS

A. Summary and Implications of Findings

1. Qualitative Phase

Several key themes that emerged from our qualitative work. Our participants chose to engage in complementary and alternative medicine (CAM) behavior because they believed that CAM helped them improve their HIV health, more specifically, that it increased their CD4+ cells, energy level and decreased their HIV viral load. Multiple studies have shown that HIV infected individuals experience various side effects while taking traditional HIV medications. Side effects include nausea, diarrhea, weight loss and weight gain just to name a few. Women in this study reported that they did not experience side effects of using complementary and alternative medicine and that alternative medicine had a way of masking side effects from the conventional HIV medications. For example, one respondent stated that drinking green tea ease the diarrhea that was caused from her HIV medication. A few women stated that they used marijuana because it stimulated their appetite, which was lost as a result from their HIV medications. The women’s experiences suggest that alternative medicine plays an important role in HIV treatment because it does not produce any side effects and/or it helps in relieving side effects of HIV medications.

It has been noted that engaging in spiritual practices (i.e., church attendance, reading the bible, prayer, etc.) is an important aspect of African American culture, especially in African American women. Another key finding from our study is that the women believed God was solely responsible for their HIV health. They believed that
man-made medications alone did not have the power to heal them. Some of the women rationalized that God put man here on earth and gave him the power to develop the medications; therefore, taking HIV medications was a good thing because ultimately it was God who created it. At the same time, some women expressed that they were given the HIV by God because at one point in their lives they had turned away from Him and His word. Clearly our findings suggest that religion and faith in God, does have some influence on how women perceive their HIV illness and treatment.

Lastly, respondents believed that engaging in complementary and alternative therapies allowed them a sense of control in their HIV treatment. Participants reported that they were free to use complementary and alternative medicine whenever they wanted without being on a scheduled regimen. They felt as though alternative therapies kept them free from being restricted in their care. Our findings are consistent that other studies that show patients engage in complementary and alternative behavior because of a desire to be more actively involved in their HIV treatment decisions and care (Foote-Ardah, 2003; Gillett et al., 2002; Sparber et al., 2000).

2. Quantitative Phase

Among the 182 HIV-positive Black women in this study, 89% reported using some type of complementary and alternative medicine for treatment of their HIV. For the quantitative phase of this study, 153 Black women between the ages of 26-73 completed the quantitative questionnaire. Overall, 45% percent of respondents used dietary supplements, while 70% used spiritual practices to treat their HIV. Attitudes, subjective norms, and perceived behavioral control were found to be significant predictors of intention for dietary supplements use, as part of HIV care explaining 70% (p
<.0001) of the variance. Attitudes and perceived behavioral control were found to be significant independent predictors once all the TPB-related variables were added to the model. Our findings suggest that positive perceived attitudes towards dietary supplements and greater perceived control over use may have contributed to a higher intention in dietary supplements use. For intention to engage in spiritual practices as part of care, attitudes, subjective norms, and perceived behavioral control were found to be significant predictors explaining 77% ($p<.0001$) of the variance. All were found to be significant independent predictors of spiritual practices use when all TPB variables were included in the model. This finding shows that more positive perceived attitudes, more perceived social support in use and a greater perceived control over use may have contributed to higher intentions of spiritual practices use for treatment of HIV.

In our quantitative work, we also investigated whether dietary supplements use and spiritual practices use had an effect on HIV medication adherence. Our bivariate Chi-Squared analysis revealed that there was no significant difference in adherence between those who were users and non-users of dietary supplements ($\chi^2 = 0.026$, $p = 0.871$). Similarly, when exploring HIV adherence and spiritual practices for treatment of HIV, our bivariate analysis also revealed that there was no significant differences in HIV adherence between users and nonusers ($\chi^2 = 0.357$, $p = 0.550$). Further investigation on whether other forms of complementary and alternative medicine play a role in either facilitating of distracting HIV medication use needs to occur, especially as we found a trend toward a more protective effect but lacked power to conclusively state this finding.

**B. Implications for Health Education Practice**
According to Hsiao and colleagues (2003), one-third of their HIV positive study participants did not openly disclose their complementary and alternative medicine use with their health care provider. In the qualitative phase of our study, some participants confirmed this finding. Similarly, Wynia and colleagues (1999) reported that only 26% of the physicians in their study, inquired about CAM usage in their HIV patients. The authors found that 63% of the physicians in their study believed that CAM therapies maybe helpful in the treatment of their HIV patients. One implication for the field of health education is that HIV health care providers will need to have a more open discussion with their patients about CAM use for treatment of HIV, since CAM use is indeed occurring among HIV infected individuals whether the provider knows it or not. One way that discussions can happen among patient and provider is through a campaign by the National Center for Complementary and Alternative Medicine (NCCAM) entitled “Time to Talk about CAM: Healthcare Providers and Patients Need to Ask and Tell”.

This educational campaign was developed in 2008 to encourage patients and their health care providers to openly discuss the use of complementary and alternative medicine. In this campaign, patients are encouraged to disclose their CAM usage to their healthcare provider and in turn, health care providers are expected to ask their patients about CAM usage as well. By having a more in-depth discussion about CAM, health care providers can offer advice that could help in minimizing the risk of using certain alternative therapies that may contraindicate with a patient’s HIV medications. Also, this exchange between provider and patient, allows the patient to be more proactive in managing their HIV care.
Seventy percent of the women in our study used spiritual practices to treat their HIV. Most women in our study stated that they used spiritual practices every day as a form of treatment for their HIV. Because of the stigma that is associated with being HIV positive, many African Americans decide to delay seeking treatment because of a fear of disclosure and possible rejection from their social network, including the church (Hatchett, Duran, & Timmons, 2000). Given the centrality of faith in most of the Black women who participated in our study, another implication for the field of health education is to collaborate with faith based institutions and incorporate them into the treatment and care HIV-positive Black women. There are numerous studies that show that the Black church has been involved in providing messages and programs for HIV prevention (Francis & Liverpool, 2009). According to Fullilove and Fullilove (1999), the church has an ethical responsibility to become involved in the AIDS epidemic in the Black community. HIV ministries established in churches that are serving persons living with HIV/AIDS are becoming more and more visible in the Black community (Reese, 2011). These ministries should be used as a venue to provide support, CAM information and current HIV medication education to persons living with HIV/AIDS in the Black community, especially among Black women.

In our quantitative phase, we found that there was no difference in medication adherence between users and nonusers of dietary supplements, which suggests that HIV adherence behavior is not mediated by this type of CAM. Additionally, we also found similar results among users and nonusers of spiritual practices. Our analysis revealed that there was no difference between users and nonusers of spiritual practices. These findings are important because it lets providers know that people who use complementary and
alternative medicine do so without distracting them from taking their HIV medication. Most of the women in our quantitative phase \((N = 127)\) were using CAM as a complement with their HIV medication. Only 26 participants were not currently taking any HIV medication, however 20 of these participants were using some type of alternative medicine. This finding suggests that these 20 women were using CAM as a substitute for the HIV medication while the other the other 127 in this phase were using CAM as a complement to their HIV medication. Our findings are consistent with Hsiao et al., 2003 who reported that 3% of their study participants used CAM as a substitute or used CAM instead of their HIV medication.

C. **Overall Limitations**

There are several limitations in this study. While the generalizability of the results may be limited to the target population in this study, this population is among the groups with the largest increases; thus better understanding of this group is critical and well justified as the study focus. Participants were primarily low-income, HIV positive Black women and were English-speaking women who were physically able to participate in this study, and complete a self-administered survey (i.e. thus they had sufficient reading and comprehension skills). Another limitation was that the data was dependent upon respondent’s self-report, (i.e. accuracy as well as knowledge) of CAM therapies and/or their willingness to report use accurately. A last limitation was that this study was a cross-sectional design, thereby limiting our ability to come to causal conclusions, CAM use and the other independent variables. However, to address the cross-sectional nature of the data and the self-report issue, we employed a mixed methods approach that allowed us to verify observed patterns in the qualitative, contextual phase with the survey
results. Based on the congruity of the findings across the phases of the research, we are fairly certain of the veracity of our findings.

**D. Overall Strengths**

Strengths of this study are several. Again to help us address the potential limitation discussed above, we utilized a mixed method design. Mixed methods designs can be useful in research because narratives from qualitative data can be used to add information to qualitative data and vice versa. Using a mixed method design can answer broader and more complete range of research questions because the researcher is not confined to a single method or approach. Lastly, a mixed methods design is useful in research because it can provide stronger evidence for a conclusion through convergence of findings (Johnson & Onwuegbuzie, 2004). Another strength of our study is the innovation and high public health significance of the topic. Black women are not easily recruited to this type of research but are a priority population in this epidemic given the high rates of HIV positive women and relatively little published research. Lastly, this study was able to explore personal experience about alternative medicine use among a sub-population that are not often studied or are understudied. Clearly the field of HIV needs to have better knowledge about special needs of this population to allow us to better serve them.

**E. Recommendations for Future Studies**

By examining the proximal variables of the TPB as well as intention to engage in CAM behavior, the results of this study will allow us to inform strategies and interventions toward HIV care and treatment of HIV-positive Black women. This study was able to explore personal experiences about CAM use in this population that is not
often studied or understudied and thus add important knowledge to the literature. Further studies investigating TPB related concepts and CAM use among HIV infected Black women need to be conducted in order to support our findings. Studies that incorporate behaviors and beliefs of CAM usage for other infected populations would also be beneficial (Kronenberg et al., 2006)

Future research is needed to examine how different populations benefit from the results of this study. Our study population was low-income HIV positive Black women in Southern and Northern California, so the results can only be generalized to similar populations. Furthermore, the participants in our study were between the ages of 26-73. We were not able to recruit anyone between the ages of 18-25; which is surprising because according to the CDC, this age group has the high rates of HIV infection. Therefore, further investigation is needed to explore beliefs about CAM use for treatment of HIV as well as how CAM use influences or distract HIV medication adherence in younger women (ages 18-25).

Improving immune function in a person with HIV is important because the HIV virus is involved in weakening a person’s immune system. Multiple studies have confirmed that CAM has the ability to improve immune function (increase of CD 4+ cells and decrease of HIV viral load) among HIV infected individuals. Women in our study expressed the need for more clinical trials that show how effective various CAM approaches may be in improving immune function without the use of current HIV medications.

It is important to further explore CAM use among HIV infected individuals because researchers have shown that certain types of CAM can dangerously interact with
the conventional HIV medications. Certain CAM therapies such as vitamin C, St. John’s wort and garlic have been shown to cause reduced concentrations of the HIV antiretroviral, indinavir (Piscitelli, et al., 2000; Slain et al., 2005). This is a concern because of contraindication between CAM with HIV medications can cause antiretroviral resistance and treatment failure. Participants in our study noted that other alternative therapies such as grapefruit and certain types of grapes do have the ability to interfere with various types of HIV medication. Further research is needed to investigate whether other types of CAM can interfere with various HIV medications. Power et al. (2002) states that “Understanding the contraindications of alternative therapies is necessary to prevent deleterious outcomes and to facilitate the safe and efficacious use of CAM for managing HIV” (p. 375).
REFERENCES


Ironson, G., Stuetzle, R., & Fletcher, M.A. (2006). An increase in religiousness/spirituality occurs after HIV diagnosis and predicts slower disease progression over 4 years in people with HIV. *Journal of General Internal Medicine, 21*(S5), S62-S68


Kitzinger, J. (1994). The methodology of focus groups: the importance of interaction between research participants. *Sociology of Health & Illness, 16*(1), 103-121.


Vitamin C and highly active antiretroviral therapy (HAART) adherence and effectiveness in treated HIV+ women. *Complementary Therapies in Medicine*


APPENDIX A: INSTITUTIONAL REVIEW BOARD APPROVAL

INSTITUTIONAL REVIEW BOARD
Loma Linda University
SPONSORED RESEARCH • 11188 Anderson Street • Loma Linda, CA 92350
(909) 558-4531 (voice) • (909) 558-0131 (fax)

Initial Approval Notice - Expedited

To: Montgomery, Susanne B
Department: Health Promotion & Education
Protocol: Beliefs about complementary and alternative medicine in HIV-infected black women using the theory of planned behavior

This study was reviewed and approved administratively on behalf of the IRB. This decision includes the following determinations:
Risk to research subjects: Minimal
Stipulations of approval: Approval for phase I only.

Consent Form
Unless IRB has given a specific waiver of informed consent (as documented in the approval stipulations above) the IRB-approved and stamped consent form accompanies this letter. This now becomes the official master consent form for making copies to provide to study participants.

Adverse Events / Protocol Changes
The IRB should be notified in writing of any modifications to the approved research protocol. Adverse effects must be reported to the IRB in accordance with institutional policy. If sponsor or contractual adverse event reporting requirements differ from requirements for reporting to IRB, all reporting requirements must still be met.

Protocol Review
Your protocol is tentatively scheduled for review and renewal at least two weeks prior to the approval end-date indicated above. To assure uninterrupted approval of this project, you will be sent a report form to request renewal by completing and timely returning to Office of Sponsored Research. Anticipate the approval expiration so your study does not lapse; contact IRB for assistance if necessary. In addition to reporting the requested renewal status information, you may also use the form to close the study at that time, if applicable.

Records
All records relating to this project, including signed consent forms, must be kept on file for three years following completion of the study.

Please note the PI’s name and the IRB number assigned to this IRB protocol (as indicated above) on any future communications with the IRB. Direct all communications to the IRB c/o the Office of Sponsored Research.

Thank you for your cooperation in LLU’s shared responsibility for the ethical use of human subjects in research.

Signature of IRB Chair/Designee: R.L. Riegley, M.D.
Date: 10/26/11

Loma Linda University Adventist Health Sciences Center holds Federalwide Assurance (FWA) No. 6447 with the U.S. Office for Human Research Protections, and the IRB registration no. is IOR02226. This Assurance applies to the following institutions: Loma Linda University, Loma Linda University Medical Center (including Loma Linda University Children’s Hospital, LLU Community Medical Center), Loma Linda University Behavioral Medicine, and affiliated medical practices groups.

IRB Administrator: Linda G. Halstead, M.A., Director  Sponsor: Research Ext 43070; Fax 80131; halstead@llu.edu  Ext 43042; Fax 80131, mtesterman@llu.edu

IRB Chair: Rhodes L. Riegley, M.D.  Department of Medicine  (909) 558-2041, riegley@llu.edu  Sponsor: Research  Ext 43070; Fax 80131; riegley@llu.edu
APPENDIX B: PHASE ONE RECRUITMENT FLYER

FOR BLACK WOMEN

We are looking for Black/African American women who are HIV positive and have used Complementary and Alternative (CAM) in the past year to treat their HIV/AIDS.

If you have used any of the following CAM: any vitamins, herbal remedies, home remedies, chiropractic/acupuncture care, dietary supplements, aromatherapy, yoga, T'ai chi and/or any spiritual healing or prayer over the last 12 months as part of your treatment of your HIV please give us a call to see if you are eligible to participate in a confidential 30-minute interview.

Please call (951) 389-4032 or email slino@llu.edu

Loma Linda University Adventist Health Sciences Center Institutional Review Board Approved 10/26/2011 #11H215 Chair R. Chepleno
We are looking for Black/African American women who are HIV positive and have used Complementary and Alternative (CAM) in the past year as part of your HIV treatment.

Join us in a research study about exploring your beliefs about using complementary and alternative medicine (CAM) as part of your HIV/AIDS treatment.

If you have used any of the following CAM: vitamins, herbal remedies, home remedies, chiropractic/acupuncture care, dietary supplements, aromatherapy, marijuana, yoga/T'ai chi and/or any spiritual healing or prayer over the last 12 months as part of your HIV treatment, please give us a call to see if you are eligible to participate in a 30 minute confidential interview.

Please call (951) 389-4032 or email at slino@llu.edu
Loma Linda University Institutional Review Board  
c/o Office of the Vice President for Research Affairs  
24888 Prospect Avenue  
Loma Linda, CA 92354  

September 16, 2011  

Re: Letter of Support for Ms. Stephanie Lino’s research proposal: Beliefs about complementary and alternative medicine in HIV-infected Black women using the theory of planned behavior

Dear Loma Linda University IRB:  

SPECTRUM Community Services and Research at Charles R. Drew University of Medicine and Science provides mental health, case management and other psychosocial support services to individuals living with and affected by HIV/AIDS in South Los Angeles. As Clinical Director of SPECTRUM, I am aware of Stephanie’s proposed research project and support the involvement of our clients. I look forward to working with her in its successful implementation.

Per my discussions with Ms. Lino, we have agreed that she will recruit clients at SPECTRUM by posting fliers at the agency that will include her contact information. Ms. Lino’s plan is to have clients contact her directly if they would like to participate. Ms. Lino has agreed to not directly recruit clients at the clinic and will not involve any clinic employees in any aspect of the data collection process. SPECTRUM will provide Ms. Lino with space for focus groups as well as to conduct her individual interviews.

It is my understanding that Ms. Lino’s on-site research activities will be completed by May of 2012.

If there are any questions, please contact me directly at 323-563-5865.

Sincerely,

Charles L. Hilliard, Ph.D.  
Clinical Director, SPECTRUM

CHARLES DREW UNIVERSITY OF MEDICINE AND SCIENCE  
1748 East 118th Street, Bldg M, Los Angeles, California 90059  
\( p \) 323 563 4939 \( f \) 323 563 9133 \( w \) www.cdrewu.edu  

Pioneering in Health and Education
October 25, 2011

Loma Linda University Institutional Review Board
Office of the Vice President for Research Affairs
24888 Prospect Avenue,
Loma Linda, CA 92354

Re: Letter of Support for Ms. Stephanie Lino’s research proposal: Beliefs about complementary and alternative medicine in HIV-infected Black women using the theory of planned behavior.

Dear Loma Linda University IRB,

Foothill AIDS Project provides comprehensive support services, outreach and education to those affected by or at risk of HIV/AIDS in the San Bernardino area. As Executive Director of Foothill AIDS Project, I have read through Ms. Lino’s research proposal and support the involvement of our clients in this project and look forward to working with her.

Ms. Lino will recruit our patients by posting fliers with her contact information at our service sites. Her plan is to have clients contact her directly if they would like to participate. Ms. Lino’s on-site research activities will be finished by May of 2012.

Per my discussions with Ms. Lino, we have agreed that Ms. Lino will not directly approach any clients who are at the service site. Flyers will be put in the office and any clients who would like to participate in this study must contact Ms. Lino directly. We have also agreed that Ms. Lino will not involve any of Foothill AIDS Project employees in any aspects of her research project.

If there are any questions, please contact me directly at 909-482-2066 x302.

Sincerely,

Maritza Tona
Executive Director
APPENDIX D: QUALITATIVE INTERVIEWS CONSENT FORM

UNDERSTANDING COMPLEMENTARY AND ALTERNATIVE MEDICINE USE FOR TREATMENT OF HIV

Informed Consent for Phase I (Qualitative Interviews)

UNDERSTANDING COMPLEMENTARY AND ALTERNATIVE MEDICINE USE FOR TREATMENT OF HIV

PURPOSE AND PROCEDURES
You are invited to participate in a research study conducted by Stephanie Lino, MPH, CHES, a student researcher in the DrPH program at Loma Linda University and Susanne Montgomery, a faculty member at Loma Linda University. The purpose of this study is to explore beliefs and attitudes about the use of complementary and alternative medicine for treatment of your HIV-infection. You can help us understand the use of alternative medicine in HIV infected individuals if you will be willing to give us your time to conduct interviews about this issue.

This project is looking to recruit Black/African American women over the age of 18 who are HIV-positive and have used certain types of complementary and alternative medicine (garlic; spiritual healing; prayer; vitamins; herbal remedies; aromatherapy; etc) in the past twelve months. If you decide to participate in this study, you will take part in a 15-minute audio recorded interview. You will be asked questions about your beliefs and experiences with complementary and alternative medicine you use for treatment of your HIV. The audio-recorded interview will take place in a private room at the respective clinic site during normal clinic hours. In return for your time and participation you will receive a $10 Target gift card.

POTENTIAL RISKS AND DISCOMFORTS
The primary risk of participating is the risk that your confidential answers could be compromised. In order to minimize this risk every effort will be taken to ensure your privacy. In order to keep...
your answers confidential, we will not be including your name or any personal information in the interview record, and this consent form will be kept separately from the written record of your answers. The interview will be voice recorded to allow us to accurately write down your answers to the questions, but the recording will be erased as soon as the interview is written down. Only members of the research team will have access to the data associated with this study. If the results of the research data are published or discussed at conferences, no identifiable information will be used.

The clinic staff will not know who is participating in the study and information will not be shared with your health providers. If you have any concerns at any time about your privacy, please contact Susanne Montgomery at the Behavioral Health Institute, Redlands, California, 92373 or call (909) 558-9500 for more information and assistance. If you wish to contact an impartial third party not associated with this study regarding any questions about your rights or to report a complaint you may have about the study, you may contact the Office of Patient Relations, Loma Linda University Medical Center, Loma Linda, CA 92354, phone (909) 558-4647, e-mail patientrelations@llu.edu for information and assistance.

BENEFITS
This study will not help you individually, but we hope the information from this study will allow us to identify the beliefs about complementary and alternative medicine in minority women infected with HIV. Gaining a better understanding of complementary and alternative medicine use among those currently receiving HIV related care is important to promoting a more open communication between patient and healthcare provider about this issue.

PARTICIPANTS’ RIGHT
Participation is completely voluntary, and choosing whether or not to participate will not affect your care in any way. Your doctor will not know if you choose to participate or not. You may choose to stop participating at any time during the interview. During the interview, if you do not want to answer a question, just let us know and we will move on to a different question. Even

Subject Initials __________
Date _________
Page 2 of 3

Loma Linda University
Adventist Health Sciences Center
Institutional Review Board
Approved 10/26/____ Void after 10/26/2017
Chair S. L. D. 

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after you agree to participate, you can still choose not to participate or may stop your participation at any time.

**INFORMED CONSENT STATEMENT**

By signing this consent form, I am giving my permission to be interviewed about my beliefs and experiences on complementary and alternative medicine use for treatment of my HIV. My choice to participate or my answers to the questions will not affect my care in the clinic. I understand that I may choose not to answer any question, and that I may stop participating at any time. I also understand that while confidentiality cannot be fully guaranteed, every effort will be made to protect my personal information and to keep my answers confidential. If I have any concerns about the research, I understand that I can contact Stephanie Lino at (951) 333-5117.

I have read the contents of this consent form and have listened to the verbal explanation given by the interviewer. My questions concerning the interview have been answered to my satisfaction. I hereby give voluntary consent to participate in this interview.

Signature: ___________________________  Date: ____________

Printed Name: ___________________________
APPENDIX E: QUALITATIVE INTERVIEWS SEMISTRUCTURED GUIDE

Key Informant Interview and Focus Group Guide

Behavioral beliefs

1. What do you believe are the advantages of using complementary and alternative medicines to treat your HIV?

2. What do you believe are the disadvantages of using complementary and alternative medicines to treat your HIV?

3. Is there anything else you associate with your using complementary and alternative medicine?

Normative Beliefs

4. Are there any individuals or groups that you can think of that would approve of your decision to use complementary and alternative medicine?

5. Are there any individuals that you can think of that would not approve of your decision to use complementary and alternative medicine?

6. Is there any other individuals or groups that come to mind when think about using complementary and alternative medicine?

Control Beliefs

7. What are some factors or circumstances make it easier for you to be able to use complementary and alternative medicine to treat your HIV?

8. What are some factors or circumstances that make it difficult or impossible for you to be able to use complementary and alternative medicine to treat your HIV?

9. Are there any other issues that come to mind when you think about complementary and alternative medicine?
IRB Change Request - 5110215 - This is the latest version of a survey that was pilot tested...

APPENDIX F: IRB CHANGE REQUEST-Phase TWO

IRB Change Request Form

INSTITUTIONAL REVIEW BOARD CHANGE REQUEST FORM

Principal Investigator: Montgomery, Susanne B
Department: Health Promotion & Education
Protocol Title: Beliefs about complementary and alternative medicine in HIV-infected black women using the theory of planned behavior

Current Approval Period: 10/25/2011 to 10/24/2012
Current Stipulations: Approval for phase I only.

I. CHANGE REQUEST DUE TO:
[ ] Initiated by local (LLU) Investigator.

II. PROTOCOL CHANGES:

a. Summary: This is the latest version of a survey that was pilot tested with an initial group of participants. Participants gave their feedback on the survey and these changes were then incorporated into this version. Request to begin Phase II of this study: see email 2/4/12.

b. Classification of significant change(s): ADMINISTRATIVE ONLY.

c. CHECKLIST OF ITEMS TO INCLUDE: Documentation regarding administrative changes.

"I accept responsibility for the factual content of this report and am available for discussion if additional questions are raised."

Signature of Principal Investigator: __________
Date (information provided as of this date): 2/7/12

Please return form, together with the appropriate attachments, to: Office of Sponsored Research

http://research.llu.edu/ChangeRequest_FormPrint.asp 2/7/2012
APPENDIX G: QUANTITATIVE SURVEY CONSENT FORM

UNDERSTANDING COMPLEMENTARY AND ALTERNATIVE MEDICINE USE FOR TREATMENT OF HIV

LOMA LINDA UNIVERSITY
School of Public Health

Informed Consent for Phase II (Quantitative Surveys)

UNDERSTANDING COMPLEMENTARY AND ALTERNATIVE MEDICINE USE FOR TREATMENT OF HIV

PURPOSE AND PROCEDURES
You are invited to participate in a research study conducted by Stephanie Lino, MPH, CHES, a student researcher in the DrPH program at Loma Linda University and Susanne Montgomery, a faculty member at Loma Linda University. The purpose of this study is to explore your experiences with complementary and alternative medicine (garlic; spiritual healing; prayer; vitamins; herbal remedies; aromatherapy; etc) for treatment of your HIV-infection. You can help us understand the use of alternative medicine in HIV infected individuals if you will be willing to give us a few minutes of your time to answer a questionnaire about this issue.

This project is looking to recruit Black/African American women over the age of 18 who are HIV-positive and may or may not have used certain types of complementary and alternative medicine in the past twelve months. If you decide to participate in this study, you will take part in a 100 question survey that will take about 20 minutes to complete. You may be asked questions about your beliefs and experiences with complementary and alternative medicine use for treatment of your HIV. In return for your time and participation you will receive a $10 Target gift card.

POTENTIAL RISKS AND DISCOMFORTS
The primary risk of participating is the risk that your confidential answers could be compromised. In order to minimize this risk every effort will be taken to ensure your privacy.
UNDERSTANDING COMPLEMENTARY AND ALTERNATIVE MEDICINE USE FOR TREATMENT OF HIV

order to keep your answers confidential, we will not be including your name or any personal information on the survey, and this consent form will be kept separately from the written record of your answers. Additionally, confidentiality will be ensured by storing all consent forms and survey documents in a locked file cabinet at Loma Linda University. The survey data will be in a excel table on a computer with a secured password and only members of the research team will have access to the data. If the results of the research data are published or discussed at conferences, no identifiable information will be used.

If you have any concerns at any time about your privacy, please contact Susanne Montgomery at the Behavioral Health Institute, Redlands, California, 92373 or call (909) 558-9500 for more information and assistance. If you wish to contact an impartial third party not associated with this study regarding any questions about your rights or to report a complaint you may have about the study, you may contact Charles Hilliard, Clinical Director of Spectrum HIV Clinic, Los Angeles, CA 90059, phone (323) 563-4939, for information and assistance.

BENEFITS
This study will not help you individually, but we hope the information from this study will allow us to identify the beliefs about complementary and alternative medicine in minority women infected with HIV. Gaining a better understanding of complementary and alternative medicine use among those currently receiving HIV related care is important to promoting a more open communication between patient and healthcare provider about this issue.

PARTICIPANTS' RIGHT
Participation is completely voluntary, and choosing whether or not to participate will not affect your care in any way. Your doctor will not know if you choose to participate or not. You may choose to stop participating at any time during the interview. When answering the survey, you may skip questions that you do not feel comfortable answering. Even after you agree to participate, you can still choose not to participate or may stop your participation at any time.

Subject Initials ____________  
Date ____________  
Page 2 of 3
UNDERSTANDING COMPLEMENTARY AND ALTERNATIVE MEDICINE USE FOR TREATMENT OF HIV

INFORMED CONSENT STATEMENT
By signing this consent form, I am giving my permission to explore my beliefs and experiences with complementary and alternative medicine use for treatment of my HIV. My choice to participate or my answers to the questions will not affect my care in the clinic. I understand that I may choose not to answer any question, and that I may stop participating at any time. I also understand that while confidentiality cannot be fully guaranteed, every effort will be made to protect my personal information and to keep my answers confidential. If I have any concerns about the research, I understand that I can contact Stephanie Lino at (951) 333-5117.

I have read the contents of this consent form and have listened to the verbal explanation given by the interviewer. My questions concerning the interview have been answered to my satisfaction. I hereby give voluntary consent to participate in this interview.

Signature: ___________________________ Date: __________

Printed Name: ___________________________
APPENDIX H: QUESTIONNAIRE RECRUITMENT FLYER

FOR BLACK WOMEN

We are looking for Black/African American women who are HIV positive.

We are looking at attitudes and beliefs about alternative medicines to control your HIV. Alternative medicines include vitamins, herbal remedies, home remedies, acupuncture care, dietary supplements, aromatherapy, yoga and/or any spiritual healing or prayer. You do not have to be using any of these alternative medicines to participate in this study.

To participate in a 30-minute survey about alternative medicine please call (951) 389-4032 or email slino@llu.edu

Loma Linda University
Adventist Health Sciences Center
Institutional Review Board
Approved 2/14/2012
# 5118415 Chair R.L. Rice, M.D.
APPENDIX I: QUESTIONNAIRE

Complementary and Alternative Medicine Survey

Part I. You will first be asked some questions about your current alternative medicine practices. Please check the best answer. Please let the researcher know if you have any questions or concerns.

A. History of Alternative Medicine Use

1. Are you currently (within the last 12 months) using any type of alternative medicine to help control your HIV (e.g., vitamins; garlic; Nuni/Nonni juice; boost; ensure; aromatherapy; prayer, blessed oils, exercise; meditation; herbal remedies; home remedies)?
   - [ ] Yes
   - [ ] No

2. What type of alternative medicine are you currently (within the last 12 months) taking to help control your HIV? (Check all that apply)
   - [ ] Vitamin C
   - [ ] Dietary Supplements (Nuni/Nonni juice, Boost, Ensure)
   - [ ] Spiritual Practices/Prayer
   - [ ] Garlic
   - [ ] Exercise
   - [ ] Meditation
   - [ ] Herbal Remedies
   - [ ] Home Remedies
   - [ ] Tai’Chi, Yoga
   - [ ] Other
   - [ ] I am not taking any alternative medicine

3. Did you use the alternative medicine before your H.I.V. diagnosis?
   - [ ] Yes
   - [ ] No
   - [ ] I am not using any alternative medicine

Loma Linda University
Adventist Health Sciences Center
Institutional Review Board
Approved 3/18/92
Chair R. L. R. Pom

Page 1

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4. In general, would you say your HIV health is:

- Excellent
- Very Good
- Good
- Fair
- Poor

5. Compared to a year ago, how would you rate your HIV health in general now?

- Much better than a year ago
- Somewhat better
- About the same as one year ago
- Somewhat worse than a year ago
- Much worse than a year ago

Part II: We interviewed HIV positive Black women about their alternative medicine use to treat their HIV. From the interviews, we learned that the top two alternative medicines used by these women were dietary supplements (Nonni juice, Boost, Ensure) and spiritual practices/prayer. Please answer questions about any use of dietary supplements and spiritual practices/prayer.

B. History of Dietary Supplements Use

6. Are you currently (within the last 12 months) using any dietary supplements to help control your HIV (Dietary supplements = Nonni/Nuni/Nonna juice, protein shakes, Boost, Ensure)?

- Yes
- No

7. Which dietary supplements are you currently using to help control your HIV?

- Nonni/Nonna/Nuni juice
- Boost
- Ensure
- Protein Shakes
- I do not use dietary supplements
8. Did you use dietary supplements before your H.I.V. diagnosis?

☐ Yes
☐ No
☐ I do not use dietary supplements

9. How often do you currently use dietary supplements to control your HIV? (Choose one)

☐ Seldom (some occasions per year)
☐ Sometimes (some occasions per month)
☐ Frequently (many occasions per week)
☐ Always (every day)
☐ I do not use dietary supplements

10. How long have you been using dietary supplements to control your HIV? (Choose one)

☐ Less than a month
☐ 1-6 months
☐ 6 months-1 year
☐ More than 1 year
☐ I do not use dietary supplements

11. Do you use dietary supplements in addition to your H.I.V. medications or instead of these medications? (Choose one)

☐ Instead of some of my HIV medications
☐ In addition to my HIV medications
☐ I do not currently take any HIV medications
☐ I do not use dietary supplements
12. What is your **main reason** for using dietary supplements to help control your HIV?

- [ ] Reduce side effects from H.I.V. medications
- [ ] Boost my T-cells, immune system
- [ ] Boost my energy levels
- [ ] Gain more control over my H.I.V. treatment
- [ ] Nutritional supplement
- [ ] I do not use dietary supplements

**C. History of Spiritual Practices/Prayer Use**

13. Are you currently (within the last 12 months) using any spiritual practices/prayer (including blessed oils, or any religious rituals/rites) to help control your HIV?

- [ ] Yes
- [ ] No

14. Did you use spiritual practices/prayer before your H.I.V. diagnosis?

- [ ] Yes
- [ ] No
- [ ] I do not use spiritual practices/prayer

15. How often do you currently use spiritual practices/prayer to help control your HIV? (Choose one)

- [ ] Seldom (some occasions per year)
- [ ] Sometimes (some occasions per month)
- [ ] Frequently (many occasions per week)
- [ ] Always (every day)
- [ ] I do not use spiritual practices/prayer
16. How long have you been using spiritual practices/prayer to control your HIV? (Choose one)

☐ Less than a month
☐ 1-6 months
☐ 6 months-1 year
☐ More than 1 year
☐ I do not use spiritual practices/prayer

17. Do you use spiritual practices/prayer in addition to your HIV medications or instead of these medications? (Choose one)

☐ Instead of some of my HIV medications
☐ In addition to my HIV medications
☐ I do not currently take any HIV medications
☐ I do not use spiritual practices/prayer

18. What is your main reason for using spiritual practices/prayer to help control your HIV?

☐ Reduce side effects from HIV medications
☐ Boost my T-cells, immune system
☐ Gives me strength, motivation to keep going
☐ Gain more control over my HIV treatment
☐ I do not use spiritual practices/prayer
Part III. In this section we would like to learn about how you feel regarding dietary supplements and spiritual practices/prayer use to help control your HIV. We would like to know how you feel about dietary supplements and spiritual practices/prayer regardless if you actually use them. Please circle the best answer even if you have or have not currently used dietary supplements or spiritual practices/prayer to help control your HIV.

EXAMPLE on how to answer the next section:

The Food at McDonalds is:

If you think the food at McDonalds is extremely good, then you would circle the number 7, as follows:

<table>
<thead>
<tr>
<th>bad</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>good</th>
</tr>
</thead>
</table>

If you think the food at McDonalds is quite bad, then you would circle the number 2, as follows:

<table>
<thead>
<tr>
<th>bad</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>good</th>
</tr>
</thead>
</table>

If you think the food at McDonalds is neither good nor bad, then you would circle the number 4 as follows:

<table>
<thead>
<tr>
<th>bad</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>good</th>
</tr>
</thead>
</table>

D. Attitudes on Dietary Supplements

19. In the past three months, I have used dietary supplements at least once a week to treat my HIV?

<table>
<thead>
<tr>
<th>false</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>true</th>
</tr>
</thead>
</table>

20. During the next three months I intend to regularly (at least twice a week) take dietary supplements to help control my HIV.

<table>
<thead>
<tr>
<th>unlikely</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>likely</th>
</tr>
</thead>
</table>
21. During the next three months, I plan to take dietary supplements to help control my HIV.

unlikely 1 2 3 4 5 6 7 likely

22. During the next three months, how likely is it that you will take dietary supplements to help control your HIV?

unlikely 1 2 3 4 5 6 7 likely

23. Overall, I think my taking dietary supplements to help control my HIV would be...
(please answer 23a-23e).

23 a. bad 1 2 3 4 5 6 7 good
23 b. pleasant 1 2 3 4 5 6 7 unpleasant
23 c. harmful 1 2 3 4 5 6 7 beneficial
23 d. favorable 1 2 3 4 5 6 7 unfavorable
23 e. positive 1 2 3 4 5 6 7 negative

24. Most people who are important to me approve of my taking dietary supplements to help control my HIV at least once a week for the next three months.

disagree 1 2 3 4 5 6 7 agree

25. People who are important to me would want me to take dietary supplements to help control my HIV.

disagree 1 2 3 4 5 6 7 agree

26. I feel under social pressure to take dietary supplements to help control my HIV.

disagree 1 2 3 4 5 6 7 agree
27. Most HIV positive people like me are taking dietary supplements at least once a week to help control their HIV.

unlikely 1 2 3 4 5 6 7 likely

28. Other HIV-positive women approve of my taking dietary supplements at least once a week to help control my HIV.

not at all 1 2 3 4 5 6 7 very much

29. Doing what other HIV-positive women do is important to me.

not at all 1 2 3 4 5 6 7 very much

30. I am confident that I can take dietary supplements at least once a week, for the next three months.

false 1 2 3 4 5 6 7 true

31. There are factors outside my control that could prevent me from taking dietary supplements to treat my HIV.

disagree 1 2 3 4 5 6 7 agree

32. Taking dietary supplements to help control my HIV is...

difficult 1 2 3 4 5 6 7 easy

33. Whether or not I take dietary supplements to help control my HIV is entirely up to me.

disagree 1 2 3 4 5 6 7 agree
34. My using dietary supplements at least once a month to help control my HIV will result in an increase in my T-cells.

unlikely 1 2 3 4 5 6 7 likely

35. My having higher T-cells is...

bad 1 2 3 4 5 6 7 good

36. Taking dietary supplements at least once a month to help control my HIV would help my immune system.

unlikely 1 2 3 4 5 6 7 likely

37. Using dietary supplements at least once a month to help control my HIV will give me more energy.

unlikely 1 2 3 4 5 6 7 likely

38. Having more energy during the day is...

bad 1 2 3 4 5 6 7 good

39. My doctor thinks I...

should not 1 2 3 4 5 6 7 should use dietary supplements at least once a week to help control my HIV.

40. With regard to taking dietary supplements to help control my HIV, I want to do what my doctor thinks.

disagree 1 2 3 4 5 6 7 agree
41. My family thinks I...
should not 1 2 3 4 5 6 7 should use dietary supplements at least once a week to help control my HIV.

42. With regard to taking dietary supplements to help control my HIV, I want to do what my family thinks.

disagree 1 2 3 4 5 6 7 agree

43. My friends thinks I...
should not 1 2 3 4 5 6 7 should use dietary supplements at least once a week to help control my HIV.

44. It is important to me what my friends think about my taking dietary supplements.

disagree 1 2 3 4 5 6 7 agree

45. Other HIV-positive women...
do not 1 2 3 4 5 6 7 do take dietary supplements to help control their HIV.

46. Doing what other HIV positive women do is important to me.
Not at all 1 2 3 4 5 6 7 very much

47. Dietary supplements are expensive.

disagree 1 2 3 4 5 6 7 agree
48. The cost of dietary supplements would prevent me from taking them.

   disagree 1 2 3 4 5 6 7 agree

49. Dietary supplements are not always readily available.

   disagree 1 2 3 4 5 6 7 agree

50. Traveling far to get dietary supplements would prevent me from taking them.

   disagree 1 2 3 4 5 6 7 agree

51. I am in control of my HIV health when I take dietary supplements.

   disagree 1 2 3 4 5 6 7 agree

52. Having a feeling of being control of my health makes it easier to use dietary supplements.

   disagree 1 2 3 4 5 6 7 agree

E. Attitudes on Spiritual Practices/Prayer

53. In the past three months, I have used spiritual practices/prayer at least once a week to help control my HIV?

   false 1 2 3 4 5 6 7 true

54. During the next three months I intend to regularly (at least twice a week) use spiritual practices/prayer to help control my HIV.

   unlikely 1 2 3 4 5 6 7 likely
55. During the next three months, I plan to use spiritual practices/prayer to help control my HIV.

unlikely 1 2 3 4 5 6 7 likely

56. During the next three months, how likely is it that you will use spiritual practices/prayer to help control your HIV?

unlikely 1 2 3 4 5 6 7 likely

57. Overall, I think my using spiritual practices/prayer to help control my HIV would be...
(please answer 57a-57e).

57 a. bad 1 2 3 4 5 6 7 good
57 b. pleasant 1 2 3 4 5 6 7 unpleasant
57 c. harmful 1 2 3 4 5 6 7 beneficial
57 d. favorable 1 2 3 4 5 6 7 unfavorable
57 e. positive 1 2 3 4 5 6 7 negative

58. Most people who are important to me approve of my using spiritual practices/prayer to help control my HIV at least once a week for the next three months.

disagree 1 2 3 4 5 6 7 agree

59. People who are important to me would want me to use spiritual practices/prayer to help control my HIV.

disagree 1 2 3 4 5 6 7 agree

60. I feel under social pressure to use spiritual practices/prayer to help control my HIV.

disagree 1 2 3 4 5 6 7 agree
61. Most HIV positive people like me using spiritual practices/prayer at least once a week to help control their HIV.

unlikely 1 2 3 4 5 6 7 likely

62. Other HIV-positive women approve of my using spiritual practices/prayer at least once a week to help control my HIV.

not at all 1 2 3 4 5 6 7 very much

63. Doing what other HIV positive women do to control their HIV is important to me.

not at all 1 2 3 4 5 6 7 very much

64. I am confident that I can use spiritual practices/prayer at least once a week, for the next three months.

false 1 2 3 4 5 6 7 true

65. There are factors outside my control that could prevent me from using spiritual practices/prayer to help control my HIV.

disagree 1 2 3 4 5 6 7 agree

66. Using spiritual practices/prayer to help control my HIV is...

difficult 1 2 3 4 5 6 7 easy

67. Whether or not I use spiritual practices/prayer to help control my HIV is entirely up to me.

disagree 1 2 3 4 5 6 7 agree
68. My using spiritual practices/prayer at least once a week to help control my HIV will result in having increased strength to keep going.

unlikely 1  2  3  4  5  6  7  likely

69. My having more strength is...

bad  1  2  3  4  5  6  7  good

70. Using spiritual practices/prayer at least once a week to help control my HIV would help my immune system.

unlikely 1  2  3  4  5  6  7  likely

71. My having a healthier immune system is...

bad  1  2  3  4  5  6  7  good

72. Using spiritual practices/prayer at least once a week to treat my HIV will give me increased motivation to keep going.

unlikely 1  2  3  4  5  6  7  likely

73. Having more motivation to keep living is...

bad  1  2  3  4  5  6  7  good

74. My family thinks I...

should not  1  2  3  4  5  6  7  should

use spiritual practices/prayer at least once a week to help control my HIV.
75. With regard to using spiritual practices/prayer to help control my HIV, I want to do what my family thinks.
   disagree 1 2 3 4 5 6 7 agree

76. My friends thinks I...
   should not 1 2 3 4 5 6 7 should
   use spiritual practices/prayer at least once a week to help control my HIV.

77. It is important to me what my friends think about my using spiritual practices/prayer.
   disagree 1 2 3 4 5 6 7 agree

78. Other HIV positive women...
   do not 1 2 3 4 5 6 7 do
   use spiritual practices/prayer to help control their HIV.

79. Doing what other HIV-positive women do is important to me.
   not at all 1 2 3 4 5 6 7 very much

80. Using spiritual practices/prayer to control my HIV is free.
   disagree 1 2 3 4 5 6 7 agree

81. The cost of spiritual practices/prayer would make it easier for me to use it to help control my HIV.
   disagree 1 2 3 4 5 6 7 agree
82. Using spiritual practices/prayer is always available (can pray whenever you want).

disagree 1 2 3 4 5 6 7 agree

83. Being able to call on God whenever you want would make it easier for me to use spiritual practices/prayer to help control my HIV.

disagree 1 2 3 4 5 6 7 agree

84. God is in control of my health when I use spiritual practices/prayer.

disagree 1 2 3 4 5 6 7 agree

85. Feeling like God is in control of my health makes it easier to use spiritual practices/prayer to help control my HIV.

disagree 1 2 3 4 5 6 7 agree

Part IV. The next section of the questionnaire asks about your HIV medications and adherence. We want to understand how people with HIV are really doing with their pills.

86. Are you currently on highly active antiretroviral therapy (HAART)?

☐ Yes ☐ No

87. Are you currently on any HIV antiretroviral drugs?

☐ Yes ☐ No

88. Do you ever forget to take your HIV medication?

☐ Yes ☐ No
89. In the last 30 days have you missed any of your HIV medications?
   □ Yes          □ No

90. When you feel better do you sometimes stop taking your HIV medicines?
   □ Yes          □ No

91. Sometimes if you feel worse when you take your HIV medicines, do you stop taking it?
   □ Yes          □ No

92. I believe that HIV positive women who regularly take HIV medication and not alternative medicine will have better health.
   □ Strongly Disagree
   □ Disagree
   □ Neither Agree nor Disagree
   □ Agree
   □ Strongly Agree

93. My children are what motivate me to take my HIV medication regularly.
   □ Yes
   □ No
   □ I do not have any children

Part V. You have almost completed the survey. Please answer these final demographic questions.

94. What is your age in years?
    _____ years
95. What is your highest level of education? (Choose one)
   □ Less than high school
   □ High school diploma/GED
   □ Some college
   □ College degree
   □ Some graduate school
   □ Graduate degree

96. What is your marital status? (Choose one)
   □ Single
   □ Divorced
   □ Separated
   □ Widowed
   □ Married
   □ Partnered

97. What is your yearly income? (Choose one)
   □ Less than $15,000
   □ $15,000-$30,000
   □ $30,001-$60,000
   □ More than $60,000

98. What is your primary employment status? (Choose one)
   □ Full-time worker
   □ Part-time worker
   □ Unemployed
   □ Student
   □ Disabled
   □ Retired
99. What is your primary source of health insurance? (Choose one)
   □ Private
   □ Medicare/Medicaid
   □ Uninsured
   □ Ryan White

100. What is your current housing situation? (Choose one)
   □ Rent a house
   □ Rent an apartment
   □ Own a house/condominium
   □ Live in a group home
   □ Live in a shelter
   □ Live with family/friends
   □ Homeless

101. How many children under the age of 18 do you have in your household?
   □ None
   □ One
   □ Two
   □ Three
   □ Four
   □ More than 5

102. From the best of your knowledge how did you get HIV?
   □ Sexual activity
   □ Drug use (dirty needles)
   □ Blood transfusion
   □ Through birth (from mother)
   □ I do not know

103. How long have you been HIV positive?
   ___ years

You have completed the survey. Thank you for participating. Please notify the researcher that you are finished.