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Pain and Use of Complementary and Alternative Medicine in a National Sample of Persons Living with HIV

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Abstract

The current study investigated the relationship of pain to use of complementary and alternative medicine (CAM) in a U.S. nationally representative sample of 2466 persons with HIV using data from the HIV Cost and Services Utilization Study (HCSUS). Pain was conceptualized as a need characteristic within the context of predisposing, enabling, and need (PEN) characteristics following Andersen's Behavioral Model of Health Services Use. Multivariate analyses were used to examine the association of baseline PEN characteristics with CAM use by follow-up (approximately 6 months later), including use of five specific CAM domains. Change in pain from baseline to follow-up was also examined in relation to CAM use. Baseline pain was a strong predictor of CAM use, and increased pain over time was associated with use of unlicensed or underground drugs with potential for harm. These results highlight the importance of medical efforts to control pain in persons living with HIV.

Keywords

Complementary medicine; alternative medicine; human immunodeficiency virus; pain

Introduction

Use of complementary and alternative medicine (CAM), defined as those interventions not generally provided by hospitals and clinics in the United States (U.S.), nor widely taught in medical schools (1), is common among persons living with human immunodeficiency virus (HIV). Recent estimates indicate that 53% of the first nationally representative sample of persons with HIV in the U. S. reported use of at least one CAM therapy (2). In the general population, pain is among the most common reasons for use of CAM (3). One U.S. national study of adults reported that the highest condition-specific rates of CAM use were for neck (57%) and back (47.6%) problems.(4) For individuals living with HIV, existing research

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suggests that pain remains a significant problem (5-8), despite advances in treatment. Accordingly, we recently found that 67% of the national sample of persons with HIV reported experiencing pain during the previous four weeks (9). Pain among persons with HIV may derive from various sources, including the direct effects of HIV on the peripheral or central nervous system, immune suppression (e.g., opportunistic infections), treatment for HIV (e.g., antiretroviral medications), disorders associated with HIV (7), and factors unrelated to HIV disease or its treatment, for example conditions such as low back pain which are common in the general population (7,10,11).

Despite high rates of CAM utilization among persons with HIV, key questions regarding safety and efficacy are yet to be answered through scientific studies. One of the difficulties in this research is lack of consensus regarding what is considered CAM. The National Center for Complementary and Alternative Medicine (NCCAM; http://nccam.nih.gov/health/whatiscam/ website viewed 11/9/04) has grouped CAM interventions into five domains: mind-body interventions (e.g., relaxation), biologically-based therapies (e.g., herbal medicine), manipulative/body-based methods (e.g., massage), alternative medical systems (e.g., acupuncture), and energy therapies (e.g., energy healing). Prior work in the national sample of HIV+ individuals has examined visits to CAM practitioners (12), and the use of CAM with potential for adverse effects or deleterious interactions with prescribed medical treatment (i.e., CAM therapies taken internally such as herbal preparations, megavitamins, underground/ unlicensed drugs, folk remedies, homeopathy) (2). In the latter study, 25.5% of patients reported use of CAM with potential for adverse effects and one-third of these patients had not discussed CAM use with their health care provider. These findings highlight concerns regarding CAM's side effects and interactions with conventional therapies. One study reported that among HIV patients who were taking antiretroviral medications as well as CAM, 28% had potential adverse effects (e.g., dermatitis, nausea, vomiting, diarrhea, thrombocytopenia, coagulopathies, altered mental status, hepatotoxicity, and electrolyte disturbances) that could potentially be linked to the interaction of herbal remedies with antiretroviral medications (13). Such findings underscore the need to elucidate precipitating reasons for CAM use among HIV+ individuals.

In previous work, we reported that pain was a significant predictor of subsequent utilization of outpatient services in persons with HIV (9). Persons who reported more pain had more outpatient visits, as did those whose pain increased between baseline and follow-up interviews. Notably, the relationship between pain and increased outpatient visits remained despite controlling for health status. To date, few studies have specifically examined the role of pain in the use of CAM among HIV+ individuals. Fairfield and colleagues (14) reported that pain or neuropathy was the most common reason for visiting a CAM provider, which was cited by 33% of a convenience sample of 180 HIV patients, followed by the desire to reduce stress and depression, which was cited by 27%. Another study of 256 HIV+ individuals reported that pain was independently associated with CAM use (15). However, these studies examined small convenience samples and it is unclear whether their findings generalize to understudied populations such as the poor and ethnic/racial minorities. In addition, negative findings have also been reported. One study found that in a sample of 70 HIV+ gay men, respondents with little or no pain were more likely to use CAM (16).

The objective of this study was to investigate the impact of pain on subsequent CAM use in a nationally representative sample of persons with HIV within the context of predisposing, enabling, and need characteristics specified in Andersen's Behavioral Model of Health Services Use (17,18). Predisposing characteristics such as age, gender, and race/ethnicity may influence an individual's propensity to use health services although these conditions are not directly responsible for use. Enabling characteristics include the economic and social resources that facilitate or impede care. Need-related characteristics refer to the presence or severity of illness.

In the current study, pain, clinical indicators (e.g., CD4 count, HIV/AIDS diagnostic status, vitality) and psychological symptoms (e.g., anxiety, depression, drug abuse) were included as need characteristics. We tested the hypothesis that greater baseline pain would predict increased use of CAM between baseline and follow-up (approximately 6 months later) controlling for predisposing, enabling and need characteristics. We examined overall use of CAM therapies (i.e., use of at least one CAM therapy) as well as use of CAM categorized according to the five domains specified by NCCAM. In addition, we investigated the extent to which change in pain from baseline to follow-up predicted use of CAM.

Methods

The HIV Cost and Services Utilization Study (HCSUS) derives data from interviews with a nationally representative probability sample of persons receiving care for HIV in the contiguous United States (U.S.). The reference population was restricted to persons at least 18 years old with known HIV infection who made at least one visit for regular or ongoing care to a non-military, non-prison medical provider other than an emergency department between January 5 and February 29, 1996. Full details of the design are available elsewhere (19,20).

The HCSUS used a three stage sampling design in which geographic areas, medical providers, and patients were sampled (21). The HCSUS sampled 4,042 eligible subjects, and 2,864 (71%) completed the interviews. Anonymously selected subjects were interviewed only after permission was obtained from providers or their agents. Consent forms and informational materials were reviewed by the RAND institutional review board (IRB) and a local IRB; providers signed Single Project Assurances or Independent Investigator agreements if no local board was available. This study using the HCSUS dataset was approved by the UCLA IRB. Baseline interviews began in January 1996 and ended in April 1997 (22). First follow-up interviews were conducted from December 1996 to July 1997 and were conducted with 2,466 respondents (86.1% of baseline). The interval between baseline and first follow-up averaged 225 days (median: 243 days; range: 36-517 days). A second follow-up was also conducted, but did not include use of CAM and, therefore, data from this interview were not included in this paper.

Sampling weights were used to adjust for the differential selection probabilities across subgroups of the population. The inverse of a respondent's sampling probability is his or her sampling weight. The HCSUS constructed nonresponse weights to adjust for differential cooperation rates using data collected on nonresponding patients and providers, and multiplicity weights to adjust for the fact that some patients had multiple opportunities to enter the sample. The product of these three weights forms the respondent's analytic weight (23), which estimates the number of persons in the population represented by that respondent. Using the analytic weights, estimates derived from HCSUS are designed to be nationally representative (21). The analytic weights used in the present analysis are from the first follow-up, and are adjusted for attrition from baseline. Thus inferences from the analysis are limited to those who survived until the first follow-up.

Independent Variables

Predisposing characteristics included in this study were gender, age, race/ethnicity (African American, Hispanic, white, or other [Alaskan Native, American Indian, Asian, Pacific Islander, or mixed]), education (less than high school, high school diploma, associate degree or some college, or bachelor's degree or higher), and mode of HIV exposure [heterosexual, IV-drug use (IVDU), men who have sex with other men (MSM), or “other” (related to hemophilia, a contaminated blood transfusion, or no identified source)]. Enabling characteristics were income (≤$5,000, $5,001-$10,000, $10,001-$25,000, or >$25,000), health insurance (private,

private HMO, Medicare, Medicaid, or none), and Census region (Northeast, South, Midwest, or West).

Need characteristics included the following measures of clinical health status: HIV-disease stage (asymptomatic, symptomatic without AIDS, symptomatic with AIDS), and wasting syndrome (weight loss of 10% or more and fever, diarrhea or loss of appetite in last six months) (yes/no), lowest CD4 count (0-49, 50-199, 200-499, 500+ cells/mm^3), and early access (i.e., by December 1996) to ART (active antiretroviral therapy) (yes/no). Access to ART has been found to reduce HIV severity, leading to improved physical health status (24).

Additional need characteristics in this study were pain, change in pain between baseline and first follow-up, and vitality. Our measure of pain was the bodily pain subscale of the Short-Form 36 (SF-36), a widely used and psychometrically sound instrument (25-27). Prior work has supported the reliability and validity of the SF-36 in representative samples of chronically-ill persons including those with HIV (28). Consistent with previous research using the HCSUS (9,28,35) the pain subscale was derived by averaging the responses to two items of the SF-36 and transforming the average to T scores (mean of 50, standard deviation of 10) (28) using the normative data reported by Ware and colleague (29). The two items were: 1) “During the past four weeks, how much did pain interfere with your normal work (including work outside the house and housework)? Would you say: not at all (1), a little bit (2), moderately (3), quite a bit (4), or extremely (5)?,” and 2) “How much bodily pain have you had during the past four weeks? Would you say: none (1), very mild (2), mild (3), moderate (4), severe (5), or very severe (6)?” The derived pain scale ranged from 0 to 100, with a lower score indicating more pain and a score of 100 indicating freedom from pain. The correlation between the two pain items at baseline was 0.74, $P<0.001$.

Change in pain assessed whether the respondent's pain score increased, decreased, or remained the same from baseline to follow-up. Prior work in this sample has indicated that pain persists and remains moderately constant over time (9). In the current study, the correlation between pain scores at baseline and follow-up was 0.55, $P<0.001$. Change in pain was derived by subtracting the individual's baseline scores from follow-up scores—positive changes in the pain scale indicated that the individual's level of pain decreased over time.

To assess vitality, we used the vitality subscale of the SF-36 which ranged from 0 to 100, with a higher score indicating that the person had more vitality (i.e., was less tired). Vitality was derived from two items (“How much of the time during the past four weeks did you feel tired?” and the reversed score of “How much of the time during the past four weeks did you have enough energy to do the things you wanted to do?”) that were correlated at 0.59, $P<0.001$, at baseline.

We also included the following need characteristics: anxiety (yes/no), depression (yes/no), drug dependence (yes/no), and heavy drinker (yes/no). For anxiety and depression, respondents were classified as having screened positive or negative for an anxiety or depressive disorder during the 12 months prior to the baseline interview based on the short form of the World Health Organization's Composite International Diagnostic Interview (30). Drug dependence was defined as use (i.e., without a doctor's prescription, in larger amounts than prescribed, or for a longer period than prescribed) of any of eight classifications of drugs (analgesics, amphetamines, cocaine, hallucinogens, heroin, inhalants, marijuana, sedatives) in the past year, and if the respondent reported using more than intended or having emotional/psychiatric problems related to using in the past year. Heavy drinker was defined as drinking on at least half of the days in the 4 weeks prior to baseline interview and typically having 3 or more drinks on those days. Respondents not meeting both conditions were not classified as heavy drinkers even if they drank some alcohol.

Dependent Variables

Respondents were asked whether they had used any of 16 CAM therapies for their HIV illness in the interval between baseline and follow-up. The list of CAM therapies was derived from Eisenberg et al. (1); an additional item was added to assess use of underground/unlicensed drugs, as was done previously by Hsiao et al. (2). The text of the survey was as follows*:* "I would like to ask you about some other kinds of therapies or treatments which you may have used for your HIV illness." The terms "complementary" or "alternative" were not mentioned.

We examined use of any CAM therapy (i.e., at least one of the 16 therapies listed), the number of CAM therapies used, as well as use of therapies grouped into the five domains suggested by NCCAM (http://nccam.nih.gov/health/whatiscam/ website viewed 11/9/04). The five domains and their individual therapies were: mind-body interventions (i.e., relaxation, spiritual healing, self-help groups, imagery, biofeedback, hypnosis), biologically-based therapies (i.e., herbal medicine, megavitamin therapy, underground/unlicensed drugs, lifestyle diets), manipulative/body-based methods (i.e., massage, chiropractic care), alternative medical systems (i.e., homeopathy, acupuncture, folk remedies), and energy therapies (i.e., energy healing). Although some therapies could conceivably belong to more than one category (e.g., lifestyle diet may be considered an alternative medical system), therapies were grouped into mutually exclusive domains to simplify analyses. Although self-help groups are not universally perceived as a CAM intervention, this category was included to permit comparison with studies in the general population, which included use of self-help groups.(1,4) Our results did not differ substantially when self-help groups were excluded from the analyses.

Analysis

Weighted sample means were used to estimate population prevalence parameters. Missing values for essential variables were imputed by the HCSUS consortium using a standard "hot-deck" strategy (31). For each variable being imputed, respondents were classified based on observed values for other variables. For each respondent missing a value for the variable being imputed, randomly selected donor values were chosen from those respondents in the same imputation class. Less than three percent of the data for income and less than 0.5 percent for most key variables were imputed (32). The non-response rates for CAM ranged from 0 to less than 0.2 percent. To adjust the standard errors and statistical tests for the differential weighting and complex sample design, we used the linearization methods (33) available in the Stata software package to estimate descriptive statistics (23). Our standard errors are not adjusted for imputation; however, given the slight amount of missing data, any underestimation of the variability should be small. Analytic weights were used in the estimates of the descriptive statistics for each variable used in the analyses.

We used multivariate logistic regression to evaluate the independent relationship of the predisposing, enabling, and need characteristics at baseline with the use of any CAM treatment at follow-up and, in separate analyses, with the use of the five different domains of CAM treatments. We used a multivariate Poisson regression model to analyze the independent relationship of the predisposing, enabling, and need characteristics at baseline with the number of CAM treatments used at follow-up because this dependent variable is a count measure, and therefore standard linear regression is not statistically appropriate. All analyses were conducted using analytic weights to estimate population prevalence and the standard errors accounted for the multistage sample design. Statistical analyses were performed using Stata. A standard probability level of 0.05 was used for all analyses.

Results

Respondent Characteristics

Table 1 shows the distributions of the predisposing, enabling, and need factors for the 2,466 subjects (representing 219,667 persons) included in this study and their weighted percentage of any CAM use and use of the five CAM domains. The weighted data show that the majority of the population was male and symptomatic without AIDS; roughly half were white and MSM. The mean age of the respondents was approximately 39 years. The mean pain score at baseline for the present sample was roughly 5.7 points lower than the general U.S. population mean of 75.15 (34), indicating that as a whole the current sample reported more pain. This difference in pain scores is considered clinical significant according to the recommendation by the developers of the SF-36 that a 5 point deviation in the scale is clinically significant (34). More respondents reported a decrease in pain from baseline to follow-up (42%), compared to those who reported no change (26.4%) and those who reported increased pain (31.6%) (35). A substantial proportion of respondents screened positive for anxiety or depression (36), and were classified as drug dependent or heavy drinkers (12).

Prevalence of CAM Use

Table 1 also shows the overall prevalence rates for CAM therapies included in the survey. The most popular CAM domain was mind-body with over a third of respondents endorsing use of at least one of these therapies. Biologically-based therapies were the second most popular category, with about a quarter of the sample reporting use of at least one of these therapies. Manipulative/body-based methods constituted the next most popular domain, followed by alternative medical systems. The category of energy therapies contained just one therapy (energy healing) and was the least popular, endorsed by less than 5% of respondents. The mean number of CAM therapies used was 1.4 (median: 1, range: 0-14); most (i.e., 91%) of the sample used 5 or fewer therapies.

Table 2 shows mean baseline pain scores for each CAM domain and for any CAM, grouped according to whether respondents reported use (yes) or non-use (no). Mean scores were significantly lower, indicating more pain, in respondents who reported using any CAM, alternative medical systems, mind/body, and biologically-based interventions, compared to respondents who did not use these modalities. Within the category of biologically-based interventions, respondents who endorsed using underground/unlicensed drugs had lower pain scores, indicating greater pain, compared to those who did not use such drugs (see Table 2). The difference in pain scores between respondents who did and did not report use of such drugs was greater than 5 points, indicating a clinically significant difference in pain. Pain scores did not differ between users and non-users of manipulative/body-based methods and energy healing.

Multivariate Analyses – Predisposing and Enabling Characteristics

The results of the multivariate analysis for use of any CAM therapy are shown in Table 2. Persons exposed to HIV through IV-drug use were more likely to use CAM than MSMs. Hispanic persons were less likely to use CAM than whites. Older persons were less likely to use CAM than younger persons. Those with an associate's degree or less education had lower likelihood of CAM use than those with a bachelor's degree or more education. Residents in the South were less likely to use CAM compared to those in the West.

Analyses conducted to examine predictors of use for each CAM domain revealed that the regression model was significant (P's < 0.001) for all five categories. Persons exposed to HIV through a contaminated blood transfusion or no identified source, were less likely to use alternative medical systems and manipulative/body-based methods, relative to MSMs. Older

persons were less likely to use biologically-based and manipulative/body-based methods compared to younger persons. African-Americans were less likely to use manipulative/body-based methods, relative to whites; Hispanics were less likely to use mind-body compared to whites.

For all CAM domains except energy healing, respondents with a high school or less education (relative to a bachelor's degree or more) were less likely to use such therapies. For manipulative/body-based methods, those with an associate's degree were also less likely than college-educated respondents to endorse use, while those without a high school diploma were less likely to use energy healing. Respondents with lower income (relative to >$25,000) were also less likely to use manipulative/body-based methods. Those with no insurance were more likely to use biologically-based methods, compared to those with Medicaid. Regional variations in use were also found. Relative to residents in the West, residents in the South were less likely to use biologically-based therapies, manipulative/body-based methods, and alternative medical systems, and residents in the Northeast were less likely to use manipulative/body-based methods.

Multivariate Analyses - Pain and Other Need Characteristics

Pain emerged as a strong predictor of CAM use. Those reporting greater pain at baseline (i.e., lower scores and thus less freedom from pain) were more likely to use every category of CAM therapy except energy healing. Change in pain predicted use of biologically-based therapies —those who reported decreased pain from baseline to follow-up were less likely to report use of these treatments between the two time points. Examination of the individual therapies in this category revealed that the reduction in pain across time was specifically linked to lower use of underground/unlicensed drugs (Odds Ratio [OR], 0.99; 95% Confidence Interval [CI], 0.98 – 1.00, $P < 0.02$). In addition, those reporting more pain at baseline were more likely to endorse use of such drugs by follow-up (OR, 0.99; 95% CI, 0.98 – 1.00, $P < 0.03$). Women were less likely to use underground/unlicensed drugs compared to men (OR, 0.42; 95% CI, 0.22 – 0.78, $P < 0.01$). Older persons were less likely to use such drugs relative to younger persons (OR, 0.97; 95% CI, 0.94 – 1.00, $P < 0.05$). Drug dependent respondents were more likely to use such drugs compared to non-drug dependent persons (OR, 2.11; 95% CI, 1.12 – 3.97, $P < 0.03$).

Certain need characteristics at baseline other than pain also predicted use of various CAM domains. More vitality was associated with greater use of biologically-based therapies. Screening positive for depression was related to increased use of mind/body and biologically-based therapies. Heavy drinkers were less likely to use mind-body. Of the clinical status measures, only CD4 count was associated with CAM use—respondents with CD4 count 50-199 cells/mm^3 were less likely to use manipulative/body-based methods and those with CD4 counts 200-499 cells/mm^3 were less likely to use energy healing, relative to those with a CD4 count of 500+ cells/mm^3.

Number of CAM Therapies Used (Data not shown)

Persons exposed to HIV through IV-drug use were likely to use a greater number of CAM therapies (Incidence Rate Ratio [IRR], 1.16; 95% CI, 1.01 – 1.33, $P < 0.04$), whereas those exposed by means of contaminated blood or no identified source were likely to use fewer CAM therapies (IRR, 0.68; 95% CI, 0.51 – 0.92, $P < 0.02$), relative to MSMs. Thus, IV-drug users used 1.16 times as many therapies as MSMs. Hispanic persons used fewer CAM therapies than whites (IRR, 0.81; 95% CI, 0.68 – 0.97, $P < 0.03$). Those with a high school diploma (IRR, 0.62; 95% CI, 0.49 – 0.80, $P < 0.001$) or less education (IRR, 0.45; 95% CI, 0.35 – 0.58, $P < 0.001$) used fewer CAM therapies than those with a bachelor's degree or more education.

Residents in the South (IRR, 0.59; 95% CI, 0.44 – 0.81, $P < 0.01$) and Northeast (IRR, 0.83; 95% CI, 0.69 – 1.00, $P < 0.05$) used fewer CAM therapies compared to those in the West.

Greater pain was associated with use of more CAM therapies (IRR, 1.00; 95% CI, 0.99 – 1.00, $P < 0.01$). Those who screened positive for depression used more CAM therapies compared to those who screened negative (IRR, 1.30; 95% CI, 1.12 – 1.52, $P < 0.01$). Heavy drinkers used fewer CAM therapies relative to non-heavy drinkers (IRR, 0.66; 95% CI, 0.50 – 0.88, $P < 0.01$). Compared to persons with CD4 count 500+ cells/mm^3, those with lower CD4 counts used fewer CAM therapies [CD4 < 50 (IRR, 0.78; 95% CI, 0.61 – 1.00, $P < 0.05$), 50≤CD4<200 (IRR, 0.74; 95% CI, 0.62 – 0.90, $P < 0.01$), 200≤CD<500 (IRR, 0.70; 95% CI, 0.57 – 0.87, $P < 0.01$)].

Discussion

Consistent with our hypothesis, reported pain at baseline was a strong predictor of CAM use during the approximately six month period prior to first follow-up. Patients who experienced more pain were more likely to subsequently use at least one of the 16 CAM therapies studied; they were also more likely to use a larger number of these CAM therapies. In bivariate analyses, respondents who endorsed subsequent CAM use (except for manipulative/body-based methods and energy healing) reported significantly more pain at baseline than those who did not use CAM (see Table 2). Multivariate analyses accordingly revealed that increased pain was associated with greater use of four of the five CAM domains specified by NCCAM (i.e., mind-body, biologically-based therapies, manipulative/body-based methods, and alternative medical systems). The only exception was energy healing, possibly due to the small number of patients (i.e., less than 5%) who endorsed using this therapy. In fact, pain was the only characteristic examined, with the exception of education that consistently predicted utilization across CAM domains. Regarding education, patients with less than a high school diploma were less likely to use all domains of CAM relative to college-educated patients. Notably, the relationships between pain and CAM use persisted even when controlling for objective indicators of disease progression including CD4 count and clinical stage, as well as other need characteristics such as energy, anxiety and depression.

On the other hand, changes in reported pain from baseline to follow-up were not associated with overall use of CAM. However, reductions in pain over time predicted a lower likelihood of use for biologically-based therapies. Examination of the individual therapies within this CAM domain revealed that this relationship was specific to use of underground/unlicensed drugs. Thus, patients whose pain had declined by follow-up were less likely to use these types of drugs. These findings are consistent with the notion that poorly controlled pain over time may lead HIV patients to seek out complementary, alternative, or untested drug treatments with possible adverse effects. Although the HCSUS did not specify which drugs were included in this category, use of various underground/unlicensed drugs such as oral interferon-α, disulfiram, and dinitrochlorobenzene have been documented in HIV patients (2,37). Even though relatively few patients in the sample (i.e., 5%) endorsed using underground/unlicensed drugs, there is a potential for harm from such use. Several other characteristics were also independently associated with use of underground/unlicensed drugs. Men, younger persons, those who reported more pain at baseline and those who were classified as being drug dependent in the past year were more likely to use such drugs. Given that HIV+ individuals who reported more pain might be more inclined to pursue these unproven treatments, future studies should explore whether efforts targeted at alleviating pain in the HIV+ population would lead to a reduction in the use of potentially harmful underground/unlicensed drugs.

In our earlier work with the present sample, poorer health (i.e., CD4 count <50 cells/mm^3, and less vitality) independently predicted higher use of outpatient medical services, whereas in the

present study, health status was not strongly linked with overall CAM use. Thus, clinical stage, CD4 count, vitality, presence of wasting syndrome, and early use of ART did not impact the likelihood of using at least one CAM therapy. Whereas we did find that less vitality predicted greater use of biologically-based therapies, it is notable that respondents with lower CD4 counts (i.e., 50-199 cells/mm^3) were actually *less* likely to use manipulative/body-based methods compared to those with CD4 counts of 500 or more. Similarly, low CD4 counts were associated with less use of energy healing. Moreover, patients with CD4 counts below 500 were likely to use *fewer* CAM therapies than those with CD4 counts of 500 or more. It is possible that HIV patients with low CD4 counts may be less inclined to seek unconventional treatments due to heightened concerns that such approaches may further compromise already-weakened immune systems. Disease progression in persons with low CD4 counts is more rapid than for persons with higher CD4 counts (38) and opportunistic infections are more prevalent in persons with CD4 counts below 50 cells/mm^3.

Depression emerged as an important need characteristic that was independently associated with use of CAM. Patients who screened positive for depression at baseline were more likely to use at least one CAM therapy as well as more likely to use mind-body and biologically-based therapies. Depressed patients were also more likely to use a greater number of CAM therapies. These relationships were evident even after controlling for anxiety, suggesting depression, rather than global psychological distress, specifically influenced use of CAM. Our findings are consistent with previous work in this sample showing that the presence of depression is associated with increased visits to alternative therapists (12). Prior research in a convenience sample indicated that HIV patients who use CAM to relieve stress and depression were more likely to make visits to CAM providers but were no more likely to use self-prescribed herbal, mineral, and vitamin supplements (14). By contrast, in the current nationally representative sample, depression is associated with use of both CAM practitioners and self-care including biologically-based therapies which may interfere with medical treatment for HIV. London and colleagues (12) suggested that HIV patients who are depressed may use CAM as part of a strategy to help manage depression. Thus, efforts aimed at identifying and treating depression should be considered in patients who use CAM, particularly in light of evidence supporting an association between depression and pain in HIV (36,39-41).

When pain and other need characteristics are taken into account, relatively few other characteristics evidenced significant relationships with CAM use. The most salient factor, as mentioned above, was level of education. The less educated were less likely to use CAM therapies across all domains, and they were also more likely to use smaller number of such therapies–findings that are consistent with earlier work in HIV samples indicating that higher education predicts increased CAM use (15,42,43). Overall use of CAM was not related to income level–lower income was primarily associated with less use of manipulative/body-based methods. Given that these therapies necessitate a visit to an alternative practitioner (i.e., massage therapist, chiropractor) for whose care patients pay greater out-of-pocket costs, this finding is not surprising. Insurance status also did not influence overall CAM use, which was also expected since health insurance often did not provide coverage for CAM during the sampled time period. For biologically-based therapies only, respondents with no insurance were more likely to use this CAM domain than respondents with Medicaid. It is conceivable that those without insurance are more likely to use self-care practices (e.g., use of supplements or lifestyle diets) due to lower costs and greater accessibility of these therapies.

Age, racial/ethnic and regional variations in CAM use persisted even when controlling for pain and other need characteristics. Older persons were less likely to use at least one CAM therapy as well as biologically-based and manipulative/body-based methods. Relative to whites, Hispanics were less likely to use any CAM as well as mind-body, whereas African-Americans were less likely to use manipulative/body-based methods. Hispanics were also more likely to

use fewer CAM therapies compared to whites. These findings may reflect cultural preferences for certain types of CAM, but further study is necessary. Geographic variations in use may be possibly due in part to less availability of CAM providers in certain regions.

Notably, persons exposed to HIV via IV-drug use were more likely to use any CAM and to use a greater number of such therapies, compared to MSMs. These findings are somewhat surprising given that higher education level has been consistently shown to be one of the strongest predictors of CAM use(4) and IV-drug users generally have a lower level of education than the general public (44). However, even after we controlled for education, our findings indicated that a history of IV-drug use predicts increased use of CAM. Prior research in convenience samples has revealed mixed findings with one study reporting that IV-drug users with HIV had lower rates of CAM use than MSMs (45), one study indicating the opposite pattern with MSMs reporting lower rates of CAM use than IV-drug users,(46) and one study showing no differences in CAM use (47). These disparate findings may be due to variations in survey methodology and/or definitions of CAM. As discussed by Manheimer and colleagues (44), CAM may be particularly appealing to IV-drug users either because of mistrust of the conventional medical system or due to perceptions of being stigmatized in past interactions with conventional medicine. Social isolation of IV-drug users may influence them toward using self-care or alternative therapies for health care, either by choice or out of economic necessity (44). The present study controlled for income so economic necessity is less likely to explain our finding. We previously reported greater pain at baseline in IV-drug using women in the HCSUS sample (9), highlighting the need for further research on CAM use in this subgroup of HIV patients.

Limitations to our findings should be mentioned. We used the bodily pain subscale of the SF-36 to measure pain and this subscale consisted of only two items. Therefore, important aspects of pain (e.g., pain location; sensory quality of HIV-related pain) were not assessed. Moreover, the subscale assessed pain in the previous 4 weeks and thus, the presence of pain prior to or persisting beyond this time frame was not evaluated. The CAM therapies examined in the HCSUS were derived from prior research by Eisenberg and colleagues (1); however, the list of therapies studied was not exhaustive and the survey did not include items that assessed whether respondents used CAM therapies not specifically listed. Relatedly, the item asking about underground/unlicensed drugs was developed for the purposes of the HCSUS and this item did not specify which drugs were referred to in this category. Thus, it is not possible to discern which underground/unlicensed drugs were used by respondents. The HSCUS was conducted between 1996 and 1997 and it is likely that the popularity of certain therapies may have changed since that time. For example, only one therapy (i.e., energy healing) was included in the category for energy therapies even though there are several different types of such therapies. The HCSUS did not ask about use of conventional pain treatments and so such information, which might have influenced change in pain over time, could not be included in the present analyses. Another important limitation is that the HCSUS only included persons with HIV who were receiving medical care for their HIV. Therefore, those with very poor access to medical care, those who are less compliant, and those who are relatively healthy are likely underrepresented (32). Often, persons in the early stages of the disease are not receiving care for HIV (32). Thus, the relationship between pain and CAM use for these persons may be different from that found in this study although even persons in the early stages of HIV may experience pain (48).

In sum, our findings suggest that pain is an important predictor of use of CAM in persons living with HIV, including both self-care and visits to CAM practitioners. Moreover, patients whose pain declined over time were less likely to have used underground/unlicensed drugs—findings that are consistent with the notion that poorly controlled pain over time may lead HIV patients to seek out untested drug treatments with the potential for adverse effects. Depression was also

associated with the use of underground/unlicensed drugs. Thus, greater efforts at alleviating pain and symptoms of depression may be directed at HIV populations with a view to reducing use of underground or unproven drug therapies. The present results are consistent with our earlier work in this sample demonstrating that pain is a significant predictor of outpatient services utilization. Previously, we found that patients who reported more pain and those who developed more pain over time used more outpatient services, after controlling for clinical indicators and sociodemographic factors (9). Taken together, the prior findings and the results of the current study suggest that pain is a significant need characteristic that influences use of conventional health services as well as use complementary and alternative care, irrespective of clinical health indicators. Since pain is a significant factor associated with use of CAM, further research on the safety and efficacy of CAM approaches for pain in HIV is warranted.

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References

1. Eisenberg DM, Kessler RC, Foster C, et al. Unconventional medicine in the United States: prevalence, costs, and patterns of use. N Eng J Med 1993;328:246–252.
2. Hsiao AF, Wong MD, Kanouse DE, et al. Complementary and alternative medicine use and substitution for conventional therapy by HIV-infected patients. J Acquir Immune Defic Syndr 2003;33:157–165. [PubMed: 12794548]
3. Bausell RB, Lee W, Berman BM. Demographic and health-related correlates of visits to complementary and alternative medical providers. Med Care 2001;39:190–196. [PubMed: 11176556]
4. Eisenberg DM, Davis RB, Ettner SL, et al. Trends in alternative medicine use in the United States, 1990-1997. JAMA 1998;280:1569–1575. [PubMed: 9820257]
5. Breitbart W, Rosenfeld BD, Passik SD, et al. The undertreatment of pain in ambulatory AIDS patients. Pain 1996;65:243–249. [PubMed: 8826513]
6. Frich LM, Borgbjerg FM. Pain and pain treatment in AIDS patients: a longitudinal study. J Pain Symptom Manage 2000;19:339–347. [PubMed: 10869874]
7. Hewitt DJ, McDonald MV, Portenoy RK, et al. Pain syndromes and etiologies in ambulatory AIDS patients. Pain 1997;70:117–123. [PubMed: 9150284]
8. Vogl D, Rosenfeld BD, Breitbart W, et al. Symptom prevalence, characteristics, and distress in AIDS outpatients. J Pain Symptom Manage 1999;18:253–262. [PubMed: 10534965]
9. Dobalian A, Tsao JCI, Duncan RP. The role of pain in the use of outpatient services among persons with HIV: results from a nationally representative survey. Med Care 2004;42:129–138. [PubMed: 14734950]
10. Breitbart W, Patt RB. Pain management in the patient with AIDS. Pain Manage 1994;2:391–399.
11. Del Borgo C, Izzi I, Chiarotti F, et al. Multidimensional aspects of pain in HIV-infected individuals. AIDS Patient Care STDS 2001;15:95–102. [PubMed: 11224935]
12. London AS, Foote-Ardah CE, Fleishman JA, Shapiro MF. Use of alternative therapists among people in care for HIV in the United States. Am J Public Health 2003;93:980–987. [PubMed: 12773365]
13. Kassler WJ, Blanc P, Greenblatt R. The use of medicinal herbs by human immunodeficiency virus-infected patients. Arch Intern Med 1991;151:2281–2288. [PubMed: 1953234]
14. Fairfield KM, Eisenbeg DM, Davis RG, Libman H, Phillips RS. Patterns of use, expenditures, and perceived efficacy of complementary and alternative therapies in HIV-infected patients. Arch Intern Med 1988;158:2257–2264. [PubMed: 9818806]

15. Ostrow MJ, Cornelisse PG, Heath KV, et al. Determinants of complementary therapy use in HIV-infected individuals receiving antiretroviral or anti-opportunistic agents. J Acquir Immune Defic Syndr Hum Retrovirol 1997;15:115–120. [PubMed: 9241109]
16. Knippels HMA, Weiss JJ. Use of alternative medicine in a sample of HIV-positive gay men: An exploratory study of prevalence and user characteristics. AIDS Care 2000;12:435–446. [PubMed: 11091776]
17. Andersen RM. Revisiting the behavioral model and access to medical care: does it matter? J Health Soc Behav 1995;36:1–10. [PubMed: 7738325]
18. Andersen, RM. A behavioral model of families' use of health services. Center for Administration Studies, University of Chicago; Chicago: 1968. Report No.: Research Series No. 25
19. Shapiro M, Berk M, Berry S, et al. National probability samples in studies of low-prevalence diseases. Part I: Perspectives and lessons from the HIV cost and services utilization study. Health Serv Res 1999;34:951–968. [PubMed: 10591267]
20. Frankel M, Shapiro M, Duan N, et al. National probability samples in studies of low-prevalence diseases. Part II: Designing and implementing the HIV cost and services utilization study sample. Health Serv Res 1999;34:969–992. [PubMed: 10591268]
21. Lam N, Liu K. Use of space-filling curves in generating a national rural sampling frame for HIV/AIDS research. The Professional Geographer 1996;48:321–332.
22. Berry, S.; Brown, J.; Athey, L., et al. HCSUS baseline patient questionnaire documentation. RAND; Santa Monica: 1999. Report No.: MR-1090-AHCPR
23. Duan, N.; McCaffrey, D.; Frankel, M., et al. HCSUS baseline methods technical report: Weighting, imputation and variance estimation. RAND; Santa Monica: 1999. Report No.: MR-1060-AHCPRM
24. Dobalian A, Tsao JCI, Radcliff TA. Diagnosed mental and physical health conditions in the United States nursing home population: differences between urban and rural facilities. J Rural Health 2003;19:158–177.
25. Hays RD, Morales LS. The RAND-36 measure of health-related quality of life. Ann Med 2001;33:350–357. [PubMed: 11491194]
26. Stewart AL, Hays RD, Ware JEJ. The MOS short-form general health survey. Reliability and validity in a patient population. Med Care 1988;26:724–735. [PubMed: 3393032]
27. Ware JE, Sherbourne CD. The MOS 36-item short-form health survey (SF-36): I. conceptual framework and item selection. Med Care 1992;30:473–483. [PubMed: 1593914]
28. Hays RD, Cunningham WE, Sherbourne CD, et al. Health-related quality of life in patients with human immunodeficiency virus infection in the United States: results from the HIV cost and services utilization study. Am J Med 2000;108:714–722. [PubMed: 10924648]
29. Ware, JE.; Snow, KK.; Kosinski, M.; Gande, B. SF-36 health survey: Manual and interpretation guide. The Health Institute, New England Medical Center; Boston: 1993.
30. Kessler R, Andrews G, Mroczek D, B. U, Wittchen H. The World Health Organization composite international diagnostic interview short-form (CIDI-SF). Int J Methods Psychiatr Res 1998;7:171–185.
31. Brick J, Kalton G. Handling missing data in survey research. Stat Methods Med Res 1996;5:215–238. [PubMed: 8931194]
32. Bozzette S, Berry S, Duan N, et al. The care of HIV-infected adults in the United States. HIV Cost and Services Utilization Study Consortium. N Engl J Med 1998;339:1897–1904. [PubMed: 9862946]
33. Kish L, Frankel M. Inference from complex samples. J Royal Stat Society Series B 1974;36:1–37.
34. Ware, JE.; Kosinski, M.; Keller, SK. SF-36 physical and mental health summary scales: A user's manual. The Health Institute; Boston, MA: 1994.
35. Tsao JC, Dobalian A, Naliboff BD. Panic disorder and pain in a national sample of persons living with HIV. Pain 2004;109:172–180. [PubMed: 15082139]
36. Tsao JCI, Dobalian A, Moreau C, Dobalian K. Stability of anxiety and depression in a national sample of adults with HIV. J Nerv Ment Dis 2004;192:111–118. [PubMed: 14770055]
37. McCutchan, J. Alternative, unconventional, and unproven therapies. In: Merigan, T.; Bartlett, J.; Bolognesi, D., editors. Textbook of AIDS medicine. Williams & Wilkins; Baltimore: 1999.

38. Miller V, Mocroft A, Reiss P, et al. Relations among CD4 lymphocyte count nadir, antiretroviral therapy, and HIV-1 disease progression: results from the EuroSIDA study. Ann Intern Med 1999;130:570–577. [PubMed: 10189326]

39. Evans S, Ferrando S, Sewell M, et al. Pain and depression in HIV illness. Psychosomatics 1998;39:528–535. [PubMed: 9819953]

40. Leserman J, Jackson ED, Petitto JM, et al. Progression to AIDS: the effects of stress, depressive symptoms and social support. Psychosom Med 1999;61:397–406. [PubMed: 10367622]

41. Mayne TJ, Vittinghoff E, Chesney MA, Barrett DC, Coates TJ. Depressive affect and survival among gay and bisexual men infected with HIV. Arch Intern Med 1996;156:2233–2238. [PubMed: 8885823]

42. Bates BR, Kissinger P, Bessinger RE. Complementary therapy use among HIV-infected patients. AIDS Patient Care STDS 1996;10:32–36. [PubMed: 11361656]

43. Smith SR, Boyd EL, Kirking DM. Nonprescription and alternative medication use by individuals with HIV disease. Ann Pharmacother 1999;33:294–300. [PubMed: 10200852]

44. Manheimer E, Anderson BJ, Stein MD. Use and assessment of complementary and alternative therapies by intravenous drug users. Am J Drug Alcohol Abuse 2003;29:401–413. [PubMed: 12765213]

45. Anderson W, O'Connor BB, MacGregor RR, Schwartz JS. Patient use and assessment of conventional and alternative therapies for HIV infection and AIDS. AIDS 1993;7:561–565. [PubMed: 8507420]

46. Langewitz W, Ruttimann S, Laifer G, Maurer P, Kiss A. The integration of alternative treatment modalities in HIV infection--the patient's perspective. J Psychosom Res 1994;38(7):687–693. [PubMed: 7877123]

47. Singh N, Squier C, Sivek C, et al. Determinants of nontraditional therapy use in patients with HIV infection. A prospective study. Arch Intern Med 1996;156:197–201. [PubMed: 8546553]

48. Breitbart W, McDonald MV, Rosenfeld B, et al. Pain in ambulatory AIDS patients. I: Pain characteristics and medical correlates. Pain 1996;68:315–321. [PubMed: 9121820]

Table 1

Population Characteristics and Percentages of CAM Use in the HCSUS Sample (n = 2466)

	Unweighted N	Weighted % (pop.)	Any CAM %	Alt. Med. Sys. %	Mind-Body %	Biologic %	Manip./ Body-Based %	Energy Healing %
Gender								
Female	718	22.7	45.0	6.3	35.9	17.5	9.0	2.3
Male	1748	77.3	54.7	11.6	39.4	28.4	19.8	4.8
Mode of exposure								
IVDU	588	24.4	55.2	11.6	42.9	26.4	13.3	4.3
Heterosexual	507	18.7	41.7	6.5	33.0	16.2	9.5	2.0
Other	219	8.4	38.9	3.5	29.1	18.9	5.3	3.4
MSM	1152	48.4	57.8	12.5	40.3	30.7	24.5	5.2
Race/ethnicity								
African American	786	32.6	45.2	7.2	38.0	18.3	7.9	2.9
Hispanic	354	14.8	44.6	10.0	30.5	23.4	13.1	2.4
Other	77	3.3	71.4	19.7	43.8	37.8	27.9	9.7
White	1249	49.3	58.5	12.0	41.1	30.9	24.1	5.3
Education								
<High School diploma	605	24.8	39.3	4.9	28.1	15.9	7.3	1.3
High School diploma	685	27.4	50.0	7.4	37.7	21.5	13.9	4.2
Associate's degree	706	28.2	57.4	13.9	44.6	31.2	20.0	6.2
BA/BS or more	470	19.6	65.7	16.4	44.5	37.1	31.2	5.2
Income								
$0-$5,000	502	19.7	46.8	7.9	37.0	20.7	10.5	3.4
$5,001-$10,000	623	25.2	50.4	11.9	41.1	23.4	12.5	4.9
$10,001-$25,000	644	26.0	51.2	10.0	38.1	25.3	15.1	4.6
$25,001+	697	29.1	59.5	11.1	38.0	32.2	28.2	3.9
Insurance								
Private HMO	431	15.7	58.2	11.5	41.6	29.5	23.3	4.3
Medicare	462	18.4	54.6	10.4	41.6	25.1	17.0	7.2
Medicaid	713	29.1	48.2	9.5	38.3	21.1	10.6	3.2
Private	348	16.5	57.2	12.9	35.3	31.6	28.9	2.9
No insurance	512	20.4	48.8	8.7	36.8	26.3	13.3	4.2
Geographic Region								
Northeast	584	24.9	53.2	11.4	42.4	24.5	10.3	3.6
South	784	35.9	42.1	3.7	31.1	17.3	12.1	2.1
Midwest	284	10.6	55.2	10.0	43.5	26.3	18.1	8.4
West	814	28.6	64.2	18.1	42.9	37.8	29.7	6.0
Clinical stage								
Asymptomatic	214	10.5	47.7	5.9	33.1	23.3	13.1	2.7
Symptomatic without AIDS	1324	53.3	49.5	9.8	35.5	24.3	16.6	3.8
Symptomatic with AIDS	928	36.3	58.4	12.6	44.8	29.1	19.7	5.4
Wasting syndrome								
No	2095	84.9	52.3	10.0	37.8	26.0	17.9	4.2
Yes	371	15.1	54.0	12.6	43.0	25.5	14.3	4.7
CD4 Count								
0-49	519	21.0	55.3	13.1	40.6	26.6	20.5	4.8
50-199	760	30.0	56.3	9.8	43.2	27.0	15.8	3.7
200-499	974	39.3	48.3	9.3	33.7	23.9	16.4	3.8
500+	213	9.8	52.1	10.7	39.8	29.6	18.9	6.6
ART by December 1996								
No	1530	64.3	48.8	8.7	36.3	22.8	15.1	3.8
Yes	936	35.7	59.3	13.3	42.8	31.6	21.3	5.1
Anxiety								
No	1918	78.3	51.0	9.7	36.4	25.3	17.0	4.1

		Unweighted N	Weighted % (pop.)	Any CAM %	Alt. Med. Sys. %	Mind-Body %	Biologic %	Manip./ Body-Based %	Energy Healing %
Depression	Yes	548	21.7	57.9	12.9	46.6	28.2	18.6	4.6
	No	1573	64.8	48.1	8.8	34.0	23.1	15.7	3.7
Drug Dependence	Yes	893	35.2	60.7	13.3	47.0	31.2	20.3	5.3
	No	2176	88.7	51.7	10.1	37.5	25.5	17.7	4.4
Heavy Drinker	Yes	290	11.3	59.0	12.3	46.9	29.3	14.3	3.3
	No	2313	93.6	53.3	10.8	39.3	26.5	17.6	4.4
	Yes	149	6.4	41.0	4.6	29.1	17.3	13.5	2.1
Total				52.5	10.4	38.6	25.9	17.3	4.2
		Range	Mean	SE		Median			
Age		18-77	38.8	0.3		38.0			
Pain		0-100	69.5	1.0		70.0			
Change in Pain		−100 - 100	3.6	0.6		0.0			
Energy		0-100	53.7	1.1		50.0			

Table 2

Mean Baseline Pain Scores by CAM Use (*n*=2466)

		Mean Pain Score	SE
Any CAM			
	Yes	67.30	1.26[a]
	No	71.88	0.96
Alt. Med Systems			
	Yes	64.23	2.11[a]
	No	70.08	0.93
Mind/Body			
	Yes	65.95	1.20[a]
	No	71.69	1.19
Biological			
	Yes	67.09	1.90[a]
	No	70.31	0.80
Manipulative/Body-based			
	Yes	68.68	1.91
	No	69.64	0.94
Energy Healing			
	Yes	67.71	3.01
	No	69.53	0.94
Underground/Unlicensed drugs			
	Yes	63.49	3.43[a]
	No	69.76	0.91

[a]Difference in scores is significant at P≤0.05 or less.

Table 3

stic Regression Results for CAM Use (*n*=2466)

	Any CAM OR	95% CI	Alt. Med. Sys. OR	95% CI	Mind/ Body OR	95% CI	Biol. OR	95% CI	Manip./ Body-Based OR	95% CI	Energy Healing OR	95% CI	Undergd/ Unlicesd OR	95% CI
Gender														
	1.01	0.075,1.36	0.76	0.49,1.19	1.07	0.79,1.46	0.79	0.60,1.04	0.95	0.62,1.46	0.71	0.28,1.33	**0.42**[a]	0.22,0.78
	Referent													
xposure														
	1.27[b]	1.01,1.60	1.25	0.87,1.82	1.22	0.91,1.62	1.25	0.91,1.72	1.00	0.71,1.42	1.33	0.63,2.79	1.44	0.75,2.76
	0.85	0.64,1.12	1.00	0.61,1.64	0.92	0.65,1.29	0.86	0.62,1.21	0.80	0.53,1.22	0.77	0.34,1.77	0.46	0.17,1.20
	0.73	0.46,1.15	**.044**[b]	0.22,0.90	0.74	0.47,1.16	0.97	0.52,1.80	**0.32**[a]	0.19,0.54	1.03	0.32,3.29	0.86	0.29,2.50
	Referent													
n	0.98	0.75,1.28	0.98	0.56,1.70	1.20	0.94,1.53	0.81	0.60,1.11	**0.57**[b]	0.40,0.80	0.68	0.25,1.87	0.62	0.29,1.32
	0.68[a]	0.53,0.88	1.03	0.72,1.47	**0.69**[b]	0.50,0.95	0.84	0.61,1.15	0.75	0.50,1.13	0.67	0.29,1.51	0.74	0.40,1.36
	1.63	0.90,2.95	1.61	0.82,3.15	1.03	0.54,1.98	1.25	0.69,2.27	1.18	0.77,1.81	1.90	0.58,6.26	1.61	0.63,4.17
	Referent													
ucation	**0.98**[a]	0.97,0.99	1.00	0.98,1.02	0.99	0.98,1.00	**0.99**[b]	0.97,1.00	**0.98**[b]	0.96,1.00	0.99	0.96,1.02	**0.97**[b]	0.94,1.00
	0.40[a]	0.29,0.57	**0.26**[a]	0.14,0.51	**0.41**[a]	0.26,0.66	**0.43**[a]	0.26,0.72	**0.33**[a]	0.21,0.54	**0.26**[b]	0.09,0.75	1.18	0.57,2.44
	0.54[a]	0.37,0.79	**0.39**[a]	0.25,0.61	**0.62**[b]	0.42,0.94	**0.53**[a]	0.34,0.83	**0.51**[a]	0.34,0.77	0.70	0.32,1.49	0.91	0.43,1.90
	0.67[b]	0.49,0.92	0.74	0.51,1.08	0.84	0.63,1.13	0.79	0.56,1.12	**0.67**[b]	0.46,0.98	1.02	0.49,2.11	0.78	0.44,1.37
	Referent													
Income														
	0.92	0.62,1.35	1.84	0.75,4.51	1.27	0.81,1.99	0.92	0.59,1.41	**0.67**[b]	0.47,0.97	1.39	0.63,3.06	0.71	0.31,1.64
	0.93	0.63,1.37	**2.31**[b]	1.06,5.05	1.32	0.88,1.98	0.95	0.63,1.44	**0.66**[b]	0.46,0.93	1.42	0.74,2.75	0.99	0.51,1.93
	0.86	0.62,1.17	1.50	0.81,2.77	1.07	0.75,1.53	0.89	0.58,1.39	**0.65**[b]	0.45,0.95	1.20	0.63,2.31	0.94	0.47,1.91
	Referent													
surance														
	1.10	0.73,1.66	1.09	0.55,2.17	1.16	0.74,1.80	0.96	0.65,1.42	1.03	0.50,2.13	0.76	0.20,2.92	0.53	0.21,1.37
	1.18	0.98,1.42	0.88	0.57,1.35	1.07	0.86,1.33	0.99	0.76,1.30	1.22	0.86,1.72	1.66	0.96,2.88	1.06	0.56,2.01
	1.03	0.72,1.46	1.17	0.67,2.02	0.92	0.69,1.22	1.01	0.66,1.56	1.18	0.61,2.28	0.49	0.16,1.49	1.08	0.51,2.30
	1.12	0.87,1.44	1.13	0.76,1.69	1.14	0.87,1.49	**1.34**[b]	1.01,1.78	0.94	0.62,1.44	1.23	0.61,2.45	0.84	0.46,1.52
	Referent													
Region														
	0.83	0.58,1.18	0.74	0.40,1.37	1.04	0.71,1.52	0.79	0.57,1.10	**0.48**[b]	0.27,0.85	0.78	0.43,1.40	0.53	0.24,1.16
	0.69	0.41,1.17	0.56	0.25,1.25	0.92	0.66,1.27	0.67	0.26,1.77	0.66	0.42,1.04	1.73	0.60,4.96	0.62	0.15,2.56
	0.53[b]	0.31,0.90	**0.23**[a]	0.13,0.38	0.67	0.34,1.32	**0.48**[a]	0.33,0.70	**0.55**[a]	0.37,0.84	0.44	0.14,1.44	0.64	0.28,1.48
	Referent													
4 Count														
	0.89	0.54,1.46	1.08	0.65,1.80	0.84	0.51,1.39	0.66	0.41,1.06	0.88	0.58,1.34	0.47	0.21,1.03	1.24	0.27,5.67
	1.01	0.69,149	0.73	0.45,1.21	1.02	0.68,1.54	0.71	0.46,1.10	**0.65**[b]	0.45,0.94	**0.38**[b]	0.20,0.73	1.61	0.46,5.71
	0.80	0.54,1.18	0.87	0.51,1.50	0.76	0.47,1.21	0.67	0.45,1.01	0.70	0.43,1.14	**0.56**[b]	0.34,0.92	1.80	0.36,8.96
	Referent													
al Stage														
	1.12	0.69,1.83	0.64	0.38,1.09	1.10	0.68,1.78	1.02	0.65,1.60	0.83	0.45,1.52	0.70	0.22,2.27	1.02	0.42,2.47
h AIDS	1.15	0.88,1.50	1.02	0.64,1.61	1.22	0.95,1.57	1.16	0.90,1.50	1.05	0.79,1.40	1.35	0.76,2.41	1.07	0.47,2.41
AIDS	Referent													
Factors														
e	0.90	0.66,1.23	1.10	0.76,1.59	0.97	0.65,1.45	0.92	0.74,1.14	0.80	0.52,1.22	1.01	0.55,1.87	1.09	0.62,1.90
	1.04	0.85,1.28	1.09	0.77,1.53	1.21	0.94,1.57	0.95	0.71,1.26	1.04	0.75,1.42	0.95	0.62,1.45	1.18	0.69,2.01
	1.45[a]	1.19,1.78	1.41	0.92,2.16	**1.48**[a]	1.19,1.84	**1.39**[b]	1.08,1.79	1.18	0.81,1.72	1.26	0.67,2.39	0.96	0.56,1.65
e	1.04	0.74,1.47	0.94	0.61,1.44	1.12	0.85,1.46	1.04	0.71,1.52	0.68	0.46,1.01	0.57	0.22,1.47	**2.11**[b]	1.12,3.97

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Any CAM OR	95% CI	Alt. Med. Sys. OR	95% CI	Mind/ Body OR	95% CI	Biol. OR	95% CI	Manip./ Body-Based OR	95% CI	Energy Healing OR	95% CI	Undergd/ Unlicesd OR	95% CI
0.69	0.46,1.02	0.49	0.22,1.10	**0.66**[b]	0.46,0.94	0.65	0.40,1.06	0.91	0.42,1.94	0.48	0.14,1.70	1.73	0.84,3.58
1.19	0.91,1.55	1.29	0.96,1.73	1.16	0.87,1.54	1.24	0.96,1.60	0.93	0.68,1.28	1.12	0.61,2.03	1.08	0.67,1.75
0.99[a]	0.99,1.00	**0.99**[a]	0.98,1.00	**0.99**[a]	0.99,1.00	**0.99**[a]	0.98,0.99	**0.99**[b]	0.99,1.00	0.99	0.98,1.00	**0.99**[b]	0.98,1.00
1.00	0.99,1.00	1.00	0.99,1.01	1.00	0.99,1.00	**0.99**[b]	0.99,1.00	1.00	0.99,1.00	0.99	0.98,1.00	**0.99**[b]	0.98,1.00
1.00	1.00,1.01	1.01	1.00,1.02	1.00	1.00,1.01	**1.01**[b]	1.00,1.01	1.00	0.99,1.01	1.01	0.99,1.03	1.00	0.99,1.01

score equals less freedom from pain, thus more pain.

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