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Positive correlation between the usage of complementary and alternative medicine and internal health locus of control

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Abstract

BACKGROUND—Because many people with chronic medical conditions utilize complementary and alternative medicine (CAM), understanding their psychosocial characteristics may be useful to identifying effective interventions. The Health Locus of Control (HLOC) measures the perception of controlling one's own health outcomes by various attributes. People with a high internal HLOC believe that the outcome of their own health seeking is related to their behavior or personal investment. Earlier evidence has shown that a higher internal HLOC is a predictive factor of positive treatment outcomes.

OBJECTIVE—This study measured the correlation between the degree of CAM use and the level of HLOC.

DESIGN—An online cross sectional survey was conducted via public bulletin boards and invitational emails. Data from 123 useable responses were analyzed for bivariate correlation between CAM use and HLOC. Subjective reports of various medical modalities were classified into 6 CAM domains and one conventional biomedicine domain. Subscales of HLOC included *internal*, *chance*, and *powerful others*. Chronic conditions, health status, and demographics were self-reported.

RESULTS—Internal HLOC significantly correlated with CAM use (Spearman's ρ , $p < 0.004$) but not with conventional medicine use (Spearman's ρ , $p > 0.130$). Further analysis of this correlation for those people with chronic conditions could not identify a particular domain used more by people

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with a high internal HLOC ($p > 0.187$) but the lesser use of conventional medicine was significant ($p < 0.031$). CAM is either empowering or empowered patients are utilizing CAM. People who use CAM may have a better prognosis and better management of chronic conditions.

Introduction

People with chronic medical conditions face difficult and often progressive healthcare demands. Providing temporarily efficacious treatments to these patients, in addition to techniques to facilitate their independence and autonomy, gives individuals more control over their personal integrated healthcare management plan. The idea of “informed, activated patients”¹ or “patient empowerment”² is an important element for the care of chronically ill patients, as well as in healthcare reform. Many consumers who believe in holism and empowerment utilize CAM as a part of their long-term healthcare. Thorne’s qualitative analysis showed CAM use as the representation of personal responsibility for health, reframing the measures by which therapeutics are evaluated, and adopting a programmatic approach to living in the context of a chronic condition.³ To further examine what Thorne described as attitudinal characteristics of CAM users, this study was designed to investigate one aspect of health beliefs, the health locus of control (HLOC), measured by the Multidimensional Health Locus of Control (MHLC) Scale.⁴ HLOC sub-scales, including *internal* (outcomes occur due to one’s own personal investment), *chance* (outcomes occur due to random chance), and *powerful others* (outcomes occur due to external control, such as universal laws, deities or genetics), were compared between CAM users and non-users with or without self-reported chronic conditions.

The predictive ability of HLOC on prognosis was previously studied in patients with type II diabetes, and the interaction of two health loci of control was found to be a predictive indicator of lower serum hemoglobin (Hb)A1c levels.⁵ When chance and/or powerful other HLOC were high, internal HLOC negatively correlated with HbA1c concentrations. HLOC for patients on kidney dialysis was also linked to the likelihood of concomitant depressive symptoms over a 16-month period.⁶ HLOC has also been examined for cancer patients. CAM use was positively associated with a desire for personal control among both men and women with cancer. However, the motivational purpose of CAM use showed a gender difference, and HLOC was not correlated with CAM use in this population.⁷ Thus, whether internal HLOC correlates with CAM use in general vs. chronically ill populations needs to be addressed.

The following null hypotheses (H_0) were tested in this study: H_{01} : The level of internal HLOC had no correlation with the self-reported usage of CAM; H_{02} : The amount of CAM modality used was not different between people with or without chronic conditions; H_{03} : Females did not exhibit higher internal HLOC than males; H_{04} : For those reporting chronic conditions, there was no difference in the amount of CAM usage among people with low or high internal HLOC.

Methods

An internet-based survey-hosting company (SurveyMonkey.com) provided the survey link and the data storage. People under the age of 18 years old were excluded from taking this survey to assure self-directed CAM use rather than the decision of parents or guardians leading to the use of CAM. The survey link was open during the months of December 2006 and January 2007. The initial recipients of the survey by invitational email were the colleagues and acquaintances of the authors. These individuals were asked to complete the survey, and to then forward the survey link to other potential respondents in various geographical areas. Approximately 50 of the total survey participants were also recruited through the volunteer section of Craigslist.org in three cities (Boston, Chicago, San Francisco). The questionnaire

contents and the invitational email were approved by the Bastyr University Institutional Review Board for human subject safety. No monetary incentive was offered. The survey was comprised of 13 web pages including an introduction and informed consent page, with a set of one to 23 questions per web page. In this computer-based survey, study participants answered a sub-set of questions based on their answers in each field. A total of 81 possible questions were included, divided into the following categories: 1 informed consent question, 18 questions on HLOC, 23 on medical modality usage, 23 on belief, 8 on health status, 6 on demographics, and 2 comments.

Variables and Instrument

HLOC was measured by the form B of the Multidimensional Health Locus of Control (MHLC) scale⁶, containing 18 statements in which participants were asked to rate their level of agreement with each statement by a 6-point Likert scale. HLOC subscales were internal, chance, and powerful others. MHLC has a Cronbach α in the 0.60 - 0.75 range and test-retest stability coefficients ranging from 0.6 - 0.7.6 Names of 23 modalities of medicine including 6 CAM domains and a seventh domain which was conventional medicine: family or general practice, hospital, over-the-counter medications and pharmaceuticals, and participants were asked to indicate the usage of each in the past three months. The response was treated as ordinal scales, with these assignments: if a modality was “not used”, it scored ‘1’; occasional usage = ‘2’, routine use = ‘3’, and if it was the primary modality, it was scored ‘4’. The belief on the effect of health was also asked as, “even if you have not used these modalities in the past three months, in general, how much do you believe that your health could be affected by the following medical modalities or activities?” The answer “not applicable” was blanked. The degree of belief was described as “Not at all” = ‘1’ to “Greatly” = ‘4’. After the collection of data, these modalities were classified into seven categories, including five domains of CAM, one “other CAM” and one conventional modality. General health status for “physical”, “emotional” and “spiritual” aspects was also requested. Answers could be from “very poor” to “excellent.” After the subject was asked about the presence or absence of “chronic conditions,” participants who answered ‘yes’ were asked to further describe the condition by the level of severity if there were more than one chronic conditions.

Classification of Domains

The method of classifying modalities into domains was adopted from the NCCAM classification system. However, not all CAM modalities were included. CAM domains 1-6 were assigned as: Domain 1, (alternative medical systems): Ayurveda, homeopathy, naturopathic medicine, and other folk medicines; Domain 2 (mind-body interventions): counseling, hypnosis, meditation, and prayer; Domain 3 (biologically based therapies): botanical medicine, dietary supplements and nutritional interventions; Domain 4 (manipulative and body-based methods): acupuncture, osteopathic or chiropractic manipulations, massage and yoga; Domain 5 (energy therapies): energy medicine; Domain 6 (other CAM): biofeedback, hospice or home nursing. The seventh domain of conventional medicine included family or general practice, hospital, over-the-counter medications and pharmaceuticals. Because different numbers of modalities were categorized within the distinct domains, usage and belief scores were averaged within each domain to compare the usage or belief level between domains. When entire CAM use was analyzed, the average of all six CAM domains was used.

Statistical Analysis

Survey data were downloaded and imported to SPSS 15.0 (Chicago, IL). Five dichotomous variables were created from the scale variables of CAM use, CAM belief, conventional medicine use, conventional medicine belief, and internal HLOC by the median split. Chi-square

and U-statistics were used to check for inequality in the demographic distribution of high and low median splits. As described in the Results section, parametric and nonparametric statistics were employed where appropriate.

Results

The average time for taking the survey was 10 minutes (ranging from 1 to 48 minutes). Surveys completed in less than 1 minute were excluded (2 responses). When the majority of MHLC scale questions were missing, the survey was also excluded (1 response). One person did not pass through the informed consent page and was excluded. The demographic data from 123 usable surveys are shown in Table 1. Chi-square of each of five dichotomized variables and gender (2×2) and chronic conditions (2×2) and U-statistics for Age and Education revealed the gender effect of CAM use and belief. Females tended to use CAM more (Cramer's $v < 0.034$), and females believed that their health is affected by CAM modalities more than males did (Cramer's $v < 0.012$) (data not shown). Overall, 35.8% of respondents claimed having "chronic conditions" although the definition of "chronic condition" was not given. From the list of conditions described (string variables), most chronic conditions seemed to have been diagnosed by healthcare providers. As expected, the rating of health conditions between respondents with or without chronic conditions was significantly different (physical $p < 0.001$; emotional $p < 0.003$; spiritual $p < 0.048$) (data not shown). Self-reported health status was not significantly different between either high or low CAM or conventional biomedicine use.

H₀₁

The correlation between internal HLOC and CAM use was tested by Spearman's ρ nonparametric correlation because the distribution of CAM use was found to be skewed. Internal HLOC was correlated to CAM use ($\rho = 0.261$, $p < 0.004$, $N = 120$) but not to conventional medicine use ($\rho = -0.140$, $p > 0.130$, $N = 119$) (Figure 1). The relationship was positively-correlated for both people with chronic conditions ($\rho = 0.382$, $p < 0.011$, $N = 43$) and without ($\rho = 0.341$, $p < 0.002$, $N = 77$) (data not shown). People who use CAM frequently have a high internal HLOC. The other two HLOC scales and CAM use were not significantly correlated.

H₀₂

Because the presence or absence of chronic conditions was a dichotomous variable, an independent T-test was used to determine whether CAM usage levels differed between people with or without chronic conditions. The level of CAM use was significantly higher in people who reported having chronic conditions ($p < 0.018$). However, this was also true for conventional modality usage ($p < 0.001$).

H₀₃

Because females tend to use more CAM, a hypothesis was made to test whether the internal HLOC of females was higher than that of males. However, the internal HLOC level was not different between females and males ($p > 0.245$). A gender effect of HLOC was not detected by any HLOC with or without chronic conditions, consistent with published literature.

H₀₄

Whether differences in CAM usage levels by those reporting chronic conditions existed among people with low or high internal HLOC also was examined. Data from survey participants reporting chronic conditions were split at the median into low or high internal HLOC categories and usage of each domain compared between the two groups. The Mann-Whitney rank sum test was used to determine significant differences among low and high HLOC groups for each

domain, with the usage of each modality as a dependent variable, and the median split of high or low internal HLOC as a grouping variable. None of the defined CAM domains were significantly increased in use by people with high internal HLOC ($p>0.147$, $N=39$). On the other hand, it was found that if a patient's internal HLOC was higher, they used less conventional medicine ($p<0.031$, $N=39$). This result indicates that the use of the specific CAM domains identified in this study was not significantly different among people with low or high internal HLOC. However, conventional medicine usage was significantly lower with people having a high internal HLOC (Figure 2).

Discussion

Data from this study support the following conclusions: 1) study participants who use CAM frequently have a high internal HLOC; 2) participants who report chronic health conditions use both CAM and conventional modalities; 3) the internal HLOC is not different between men and women; and 4) usage of the specific CAM domains defined is not significantly different among study participants with a low or high internal HLOC, but conventional medicine use was lower by study participants with a high internal HLOC. With regard to this study, the relatively low sampling number ($N=123$) and subsequent selection bias by internet-based survey were the most obvious threats for validity. The effort to obtain geographically diverse sampling was somewhat successful. Data were collected across 24 states, but one state was over-represented (Washington, 26.9%). Of the respondents, 41.5% had a graduate degree, which was higher than U.S. average of 9.36%.⁸

The goal of searching for effective self-care management for chronic conditions is to improve the patient's quality of life, to reduce the burden to the healthcare system, and to improve satisfaction of patients as well as practitioners managing chronic health conditions of their patients. While the importance of having a high internal HLOC is known, this study reports only the correlation of CAM use with a high internal HLOC. Whether or not a CAM modality is empowering or an empowered population is using CAM was not investigated by this cross-sectional research. Chronic health conditions negatively affect physical, emotional, and spiritual wellbeing, and further interfere with effective medical interventions. Both CAM and conventional healthcare professionals have direct access to vulnerable people who suffer from health conditions. To investigate how health beliefs are modified by a healthcare system may provide valuable information for such people who are experiencing chronic health challenges. In resilience theory, the vulnerable state (disruption) provides time for introspection, change, and growth if an appropriate environment is provided for re-integration.⁹ Empowered healthcare may provide a suitable environment for those sufferers of chronic medical conditions. Small increments with longer duration of medical attention may be best provided by alternative medical systems such as naturopathic medicine or in conjunction with CAM rather than treating solely by conventional healthcare system practices.

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Figure 1. Internal Health Locus of Control is correlated to CAM use but not to Conventional Medicine Use

Internal HLOC was plotted against either CAM use (a) or Conventional Medicine use (b). Because both uses were positively skewed, the data were log-transformed for the graphical presentation. Spearman's ρ was used to determine significance of the correlation between the internal HLOC and CAM use ($\rho=0.261$, $p<0.004$, $N=120$) and Conventional Medicine Use ($\rho=-0.140$, $p>0.130$, $N=119$).

CAM domains or Conventional medicine

Figure 2. Among people with chronic conditions, conventional medicine usage decreases with high internal health locus of control

The data were selected for people with self-reported chronic conditions and the domain usage information (N=39). The mean usage (bars) and 1.0 standard error of mean (T bars) of each treatment domain is indicated for those with low ($< \frac{1}{2}$ median score) internal HLOC (gray bars) and high ($> \frac{1}{2}$ median score) internal HLOC (black bars). Mann-Whitney rank-sum test was used to detect significant differences between each pair. “*” indicates $p < 0.031$.

Table 1

Demographics

	N=123
Characteristic	Percentage
Gender	
Male	21.1
Female	75.6
Age (years)	
18 or 19	0.0
20 - 29	19.5
30 - 39	44.7
40 - 49	12.2
50 - 59	17.9
60 - 69	2.4
≥ 70	0.8
Education	
Less than 12th grade	0.0
Graduated from High School	2.4
Some college/technical school	16.3
Graduated from college	27.6
Some post-graduate education	9.8
Have graduate degree	41.5
Chronic disease	
Yes	35.8
No	64.2