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Provider-based complementary and alternative medicine use among three chronic illness groups: Associations with psychosocial factors and concurrent use of conventional health-care services.

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Summary

Objective: The focus of this study was to examine the patterns of provider-based complementary and alternative medicine (CAM) use across three chronic illness groups, and to identify the socio-demographic, health-related, and psychosocial factors associated with CAM use.

Design: Cross-sectional international survey administered on the Internet to individuals with arthritis, inflammatory bowel disease (IBD), and mixed chronic conditions.

Main outcome measures: Self-reported consultations to CAM providers and to a variety of conventional health-care services made in the previous six months.

Results: 365 surveys were received from people with arthritis (N = 140), IBD (N = 110), and other chronic conditions (N = 115). Overall 38.1 % of respondents had used CAM, with rates ranging from 31.8 to 46.1 % across the three illness groups. Backward step-wise logistic regression revealed that being female, having more than high school education, a greater number of comorbid conditions, higher perceived control over health and reward motivations, lower stress and less belief that health is governed by chance, were the best predictors of CAM consultations. CAM clients also used a greater variety of conventional health-care services and made more consultations relative to non-CAM clients.

Conclusions: In this study the socio-demographic and health status factors associated with CAM consultations in three different chronic illness groups were similar to those found in the general population. CAM use in the study population was also related to higher use and a greater variety of use of conventional health-care services, and with stronger beliefs in the controllability of health and an enduring motivation to seek out rewards.

Use of complementary and alternative medicine (CAM) has continued to rise over the past two decades prompting research into the possible motivators and factors associated with its use. In general, these empirical investigations indicate that CAM users tend to be female[1-4] and highly educated[3,5,6], with more health complaints and chronic health issues in particular[3,7-10]. Although some studies have found that CAM users are more distressed by their health problems[11-14], other studies have not[15-17]. CAM users may also have a higher sense of control over their health[18-20], and use CAM to avoid unpleasant aspects of conventional treatment[8,21], and/or to gain the positive rewards they believe that CAM can offer[20].

The factors associated with CAM use in chronic illness populations such as arthritis, inflammatory bowel disease (IBD), and cancer have also been investigated. Given the medical need of these populations it is not surprising that CAM use is high, with reported rates ranging from 28%[22] to 66%[23,24] for arthritis, 26%[12] to 52%[25] for IBD, and as high as 57% for diabetes[26], and multiple sclerosis[27]. Yet there is a paucity of research examining possible differences in the patterns of CAM use across different illness populations. The few studies that compare illness groups do so among illnesses that have similar symptomology[3,28-30], and have not examined the psychosocial and health-care use variables associated with CAM[31]. The purpose of this study was to examine CAM use across different illness groups and to determine whether the factors associated with CAM use in the general population are the same for those with chronic illness.

In general medical populations CAM use tends to be related to higher use of conventional health-care services. CAM use was associated with making more physician consultations in six large national surveys [6,7,9,32-34], and with higher rates of physician consultations after controlling for differences in health problems[35]. Research on how CAM use in chronic illness populations is related to conventional medicine consultations is limited and inconclusive. CAM was associated

with more physician consultations among older adults with arthritis[6,22], and chronic back pain sufferers[3]. However, CAM use was unrelated to physician consultations among IBD patients[36]. Examining how CAM use is related to the use of a variety of conventional health services among individuals with chronic illness in general would help clarify these inconsistencies and elucidate the types of conventional care that may be used by CAM clients.

Evidence that the psychological factors associated with CAM use in the general population may be the same for those with chronic illness is often inconsistent across different illnesses. For example, CAM use was associated with a desire for greater control over one's health in people with IBD[25,37], and cancer[20,38], but not in people with arthritis[39,40]. Poor emotional functioning has been reported in people with IBD[12,25,41], cancer[42,43], and arthritis[6,14] who use CAM. Other studies have found no psychological difficulties in CAM users with IBD[1]. One reason for these inconsistencies may be the way in which emotional well-being is defined across studies, with the terms stress, distress, and depression often used interchangeably. Moreover, these investigations have focused on the factors associated with CAM use in specific illness groups rather than examining CAM use across several illness groups simultaneously.

Research suggests that people may be pushed or pulled to use CAM by pragmatic or ideological reasons[44,45]. Dissatisfaction with conventional medicine[13,46] and a belief in the benefits of CAM[5,20,46] may motivate CAM use. Although personality dimensions have been correlated with CAM use, push/pull motives have not been examined from an individual difference perspective. CAM use may therefore be related to a tendency to be motivated by avoiding unpleasant circumstances or by approaching perceived rewards.

The primary focus of the current study was to examine the patterns of provider-based CAM use across three different chronic illness groups, and to identify the socio-demographic,

health status, and psychosocial factors associated with CAM use in people with chronic illness. A secondary focus was to compare the use of conventional health services in people with chronic illness among those who do and do not use CAM. Because medical care-seeking has been conceptualized as a coping response to deal with troubling symptoms[47], it was expected that conventional only and CAM care-seekers would be similar in characteristics which may prompt care-seeking. Any distinguishing characteristics would indicate potential motivations for seeking CAM care in particular. For this reason, only the correlates of provider-based CAM were examined. Arthritis and IBD were chosen as illness groups given the well documented use of CAM in these individuals. To compare the pattern of CAM use in these two groups with chronic illness in general, a third group with a variety of chronic conditions other than IBD and arthritis was included.

Methods

Participants and procedure

Participants were recruited through notices in the community, and to electronic support groups for IBD, arthritis, and other chronic health conditions. The current study was part of a larger investigation which examined the factors associated with the use of different forms of social support (support groups, friends/family, health services) by people with chronic illness[48]. Only the results related to the use of health services are reported here. Participants completed the appropriate version of the survey online and two participants completed the survey via mail.

Measures

With the exception of certain disease-specific questions, participants completed identical measures of the study variables. Participants reported the number of consultations made within the past six months to a chiropractor, homeo/naturopath, massage therapist or other CAM

provider, and to nine different conventional health-care professionals.

Health

Participants completed the Brief Health History questionnaire[46], a self-report checklist of 13 acute and 16 chronic health problems experienced within the last 6 months used in previous CAM research[35,46].

Stress

Stress experienced within the past 2 weeks and 6 months was rated on a 10-point scale (*not stressful at all* to *extremely stressful*). A stress index was created from the mean of the two items (r = .54).

Coping efficacy

Two items on coping efficacy[49] assessed the confidence to manage the symptoms and emotional aspects of a chronic health condition. Items are scored on a 5-pont Likert-type scale (*strongly disagree* to *strongly agree*).

Health control beliefs

Health control beliefs important for coping with chronic illness[50] were assessed with three subscales of the Control Beliefs Inventory (CBI)[51] a self-report measure previously validated with several chronic illness samples. The 7-item General Health Control subscale measured perceived control over health in general, and has good convergent validity with the Multidimensional Health Locus of Control scale (MHLC)[52]. The 5-item Symptom Control subscale of the CBI assessed the extent to which one perceives that illness symptoms can be managed and controlled, and has differentially predicted adjustment to chronic illness in relation to the General Health Control subscale[50]. The belief that health is not under one's personal control but is a matter of chance was assessed with the 5-item Chance Control subscale of the

CBI. All items are rated on a six-point Likert-type scale (*strongly disagree* to *strongly agree*). The subscales had good internal consistency with Cronbach alphas of .70 for Chance, .86 for Symptom Control, and .90 for General Control.

BIS/BAS

The 20-item BIS/BAS[53] scale assesses individual differences in the sensitivity of two general motivational systems proposed to underlie behaviour. The behavioural approach system (BAS) regulates appetitive motives and movement towards something desired, whereas the behavioural inhibition system (BIS) regulates aversive motives and movement away from something unpleasant[53]. The 5-item Reward Responsiveness BAS subscale (RBAS) and the 7-item BIS subscale used in the current study are scored with a 4-point Likert-type scale (*I agree a lot* to *I disagree a lot*). Cronbach alphas were .70 and .75 for the RBAS and BIS respectively.

Statistical methods

Data were first screened by examining the electronically received survey responses for duplication and missing data. Duplicates and surveys that were missing 20 percent or more of the required responses were excluded from the analyses.

Respondents were classified as non-CAM clients or CAM clients, based on their CAM use in the previous 6 months. Differences in the patterns of CAM use across the three illness groups were tested with ANOVA and chi-square. Differences in the conventional consultations made by each client group were assessed with chi-square and ANCOVA, controlling for the number of comorbid health problems between the client groups.

To determine the factors associated with CAM use in the total sample, a backward step-wise logistic regression was conducted with client group as the dichotomous dependent variable. All predictors of interest were entered in the first step, with a threshold of $p < 0.05$ set for

retention and $p = .06$ for removal.

Results

Participant characteristics

A total of 365 people completed the on-line survey. The majority were located in North America although given the international nature of the word wide web the participants were from a variety of locations (see Table 1 for nationality statistics). The demographic characteristics of the total sample stratified by illness group are presented in Table 1. There were 140 individuals with a self-reported diagnosis of any type of arthritis, although rheumatoid arthritis (27.9%), fibromyalgia (17.9%), and osteoarthritis (16.4%) were the most frequently reported subtypes. Of the 110 adults in the IBD group, the majority had Crohn's disease (76.0%). The 115 adults in the mixed chronic group reported one of several different chronic health conditions, including chronic migraines (16.5%), multiple sclerosis (11.3%), diabetes (10.4%), irritable bowel syndrome (9.6%), chronic fatigue syndrome (7.8%), asthma (7.0%), chronic back pain (7.0%), and cancer (4.3%).

CAM use

Overall, 38.1 % of participants had used one to four types of CAM in the previous 6 months. The average number of different CAM used was 1.52 ($SD = .80$), and the number of different types used between the arthritis ($M = 1.51$, $SD = .83$), IBD ($M = 1.43$, $SD = .74$), and mixed chronic groups ($M = 1.58$, $SD = .82$; $F(2, 136) = .40$, $p = .67$) did not differ. The proportion of participants using CAM across three chronic illness group was lowest for IBD, and highest for the mixed chronic group (Table 2). However, these proportions were not significantly different (χ^2 (2) = 5.31, $p = .07$). Among CAM clients, massage therapy was the most used CAM (63.3%), followed by chiropractic (35.3%), Naturopathy/Homeopathy (19.4%), and acupuncture (10.8%).

Another 20.1 % of CAM users had made consultations with other CAM providers including Reflexologists, Reiki healers, Iridologists, Herbalist, and Traditional Chinese Medicine practitioners. The proportion of CAM users consulting each of the CAM types stratified by illness group is presented in Figure 1. Among the illness groups more people with IBD had used Naturopathy/Homeopathy (χ^2 (2) = 6.63, $p < .05$) compared to the other two illness groups. Table 2 presents the mean numbers of CAM consultations made for each type of CAM stratified by illness group. Small group sizes precluded any reliable tests of group differences and therefore the values are presented for descriptive purposes only. Individuals in the arthritis and mixed illness groups made more visits to massage therapists and chiropractors, whereas those with IBD consulted massage therapists more often.

Conventional health service use

CAM clients consulted a greater variety of conventional health providers (adjusted M = 3.73, SE = .12) than non-CAM users (adjusted M = 3.24, SE = .09), after controlling for differences in the number of comorbid acute (M = 4.65) and chronic (M = 3.33) health problems ($F(1,361) = 11.02$, $p < .001$.)

Four of the nine conventional health services were used by a higher percentage of CAM clients as compared to non-CAM clients (see Table 3). CAM clients were more likely to use general practitioners, nutritionists/dieticians, physiotherapists, and counselors/psychologists, and reported more consultations with nutritionists/dieticians and physiotherapists compared to non-CAM clients after controlling for the number of comorbid health problems.

Factors associated with CAM use

The adjusted odds ratios and 95% CI for factors independently associated with using CAM in the previous 6 months among the total sample are presented in Table 4. Relative to

those with a high school education, respondents who had some college or university were twice as likely to use CAM, and those who had a post graduate education were almost three and a half times as likely to use CAM. Respondents who were female and had a greater number of chronic health problems, had a higher odds of using CAM. Respondents with higher perceived control over health and higher reward motivations were more likely to use CAM. The odds of using CAM were lower for individuals who believed that health was a matter of chance, who reported more stress, and were coping effectively with the emotional aspects of their illness.

Discussion

In addition to female gender and higher levels of education, CAM consultations in the current study were associated with perceived control over health, reward sensitivity, more comorbid chronic conditions, and using a greater number and variety of conventional health-care services relative to non-CAM clients.

One limitation of the current study involves the exclusive focus on the factors associated with provider-based CAM which may not be relevant for understanding CAM self-care alone or combined with provider-based CAM. However, a large national survey[54] found that beliefs in self-care were associated with consulting CAM providers, suggesting that the current findings may extend to CAM self-care. The purpose of the CAM visits (consultation versus active treatment) were not explored and thus future studies on provider-based CAM should make this distinction. Finally, although the survey was international the majority of participants were from North America and therefore the results may not extend to other continents.

The use of an Internet-based survey in this study introduced potential limitations by including only individuals who had access to a computer and the Internet, possibly excluding individuals with lower socio-economic status. Given that CAM users tend to be more affluent

and thus more computer literate, the patterns of CAM use found in the current study may not generalize to less affluent samples. However, an Internet recruited chronic illness sample may not necessarily be biased towards including those who are more in control and better able to cope simply because they are on the Internet. For example, a comparison of Internet versus community recruited IBD and arthritis samples found that the Internet samples scored higher on disease severity[55], and an Internet-recruited sample of chronic tinnitus sufferers had depression levels comparable to those in community recruited samples[50]. Accordingly, this method of sampling may be seen as a potential strength of the study in that it allowed for the inclusion of a larger and more diverse sample of people with chronic illness than what could have been recruited from the local community. In this respect, the sample characteristics are consistent with the suggestion that Internet studies produce samples that are larger and more heterogeneous than their community-based counterparts[56].

Moreover, because the study was not advertised as being explicitly about CAM use, the selection bias with respect to CAM use was minimized. That is, those who chose to complete the survey did so because of an interest in issues related to social support (including the use of health services) and their illness, and not because of an interest in CAM.

Although chronic illness is a known factor associated with CAM use in the general population[7,57], the findings from the current study are in accord with those from a study of arthritis patients[6] and chronic back pain sufferers[3], and suggest that having comorbid chronic conditions is also a key motivator for CAM use among individuals with chronic illness.

Similar to other studies of general medical[7,32,35] and chronic illness populations[3], differences in the use of conventional health-care services were found between CAM users and non-users in the present study. Whereas previous research has documented greater use of

undifferentiated conventional medical services or general physicians by CAM users, this study is one of the few to find differences in the use of a broad range of conventional health-care services between CAM users and non-users with chronic illness. The greater variety of conventional health services used concurrently by CAM users suggests that this client group may be more active health-care consumers irrespective of their greater number of health issues. This proposition is in accord with the results of a large US survey in which CAM clients used more of 7 types of preventive medical services including influenza vaccination and prostrate examination, than did non-CAM clients[32]. Indeed, CAM users may choose the combination of practitioners, both conventional and complementary, that they believe will best help their particular problem[58].

CAM clients also reported less stress, a finding that is consistent with other research[59]. However, CAM clients were also less likely to be coping effectively with the emotional aspects of their illness. One explanation for these apparently contradictory findings is that difficulty in coping emotionally with one's illness may be qualitatively different from the experience of stress in general. Furthermore, because these findings were correlational, their directionality is unclear. For example, improved stress management may be a consequence of CAM use[20,59], and insufficient emotional support from physicians[13], and coping with feelings of helplessness[17] motivated CAM use in other chronic illness studies. Consistent with a study of CAM use in IBD patients[60], CAM may be viewed as an effective way to manage stress by those with chronic illness.

Although both pragmatic and ideological reasons have been proposed to motivate CAM use[44], the present study presents evidence that CAM users have an enduring tendency to seek out rewards, rather than to avoid unpleasant circumstances. Finding a way to better manage one's

health issues, both physically and emotionally, may be viewed as a potential reward associated with CAM use especially when medical need is high.

The pattern of psychosocial factors associated with CAM consultations found in the current study also portrays those with chronic illness who use CAM as proactive seekers of solutions to their health issues rather than desperate individuals willing to try anything to escape their suffering as some researchers have suggested[11,12]. The findings with respect to perceived control over health are in accord with other research on CAM use in chronic illness populations[3,19,37,38,61] and support the suggestion that patients use CAM because it allows them to take an active role in managing health[46,62-65].

However, using more conventional health-care as a means to better manage health may come at a cost for CAM clients. he greater use of different conventional health services indicates that their health-care may be more fragmented than non-CAM users. And given the recent finding that less than 30% of chronic illness patients report their CAM use to their health-care providers[10], this may translate into a greater risk for conflicting treatments.

In conclusion, the results of this study suggest that the socio-demographic and health correlates of CAM consultations in patients with different chronic illnesses are similar to those found in the general population. CAM use in the study population was also related to higher use and a greater variety of use of conventional health-care services, and with a motivation to seek out rewards and stronger beliefs in the controllability of health, suggesting that chronically ill CAM users are proactive health-care consumers. However, the high use of different health-care services also raises the issue of continuity of care, and future research should examine the health implications of lack of disclosure about CAM use in chronic illness patients.

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References

1. Koloski NA, Talley NJ, Huskic SS, Boyce PM. Predictors of conventional and alternative health care seeking for irritable bowel syndrome and functional dyspepsia. Alimentary Pharmacology & Therapeutics 2003; 17: 841-51.

2. Tindle HA, Wolsko P, Davis RB, Eisenberg DM, Phillips RS, McCarthy EP. Factors associated with the use of mind body therapies among United States adults with musculoskeletal pain. Complementary Therapies in Medicine 2005; 13: 155-64.

3. Foltz V, St Pierre Y, Rozenberg S, Rossignol M, Bourgeois P, Joseph L, Adam V, Penrod JR, Clarke AE, Fautrel B. Use of complementary and alternative therapies by patients with self-reported chronic back pain: A nationwide survey in Canada. Joint Bone Spine 2005; 72: 571-577.

4. Barnes PM, Powell-Griner E, McFann K, Nahin RL. Complementary and alternative medicine use among adults: United States, 2002. Advance Data 2004; 343: 1-19.

5. Astin JA. Why patients use alternative medicine: Results of a national study. Journal of the American Medical Association 1998; 279: 1548-1553.

6. Fautrel B, Adam V, St-Pierre Y, Joseph L, Clarke AE, Penrod JR. Use of complementary and alternative therapies by patients self-reporting arthritis or rheumatism: Results from a nationwide Canadian survey. The Journal of Rheumatology 2002; 29: 2435-2441.

7. Al-Windi A. Determinants of complementary alternative medicine (CAM) use. Complementary Therapies in Medicine 2004; 12: 99-111.

8. Lee GBW, Charn TC, Chew ZH, Ng TP. Complementary and alternative medicine use in patients with chronic diseases in primary care is associated with perceived quality of care and cultural beliefs. Family Practice 2004; 21: 654-660.

9. Busato A, Donges A, Herren S, Widmer M, Marian F. Health status and health care utilisation of patients in complementary and conventional primary care in Switzerland--an observational study. Family Practice 2006; 23: 116-124.

10. Saydah SH, Eberhardt MS. Use of complementary and alternative medicine among adults with chronic diseases: United States 2002. Journal of Alternative and Complementary Medicine 2006; 12: 805-12.

11. Burstein HJ, Gelber S, Guadagnoli E, Weeks JC. Use of alternative medicine by women with early-stage breast cancer. New England Journal of Medicine 1999; 340: 1733-1739.

12. Langmead L, Chitnis M, Rampton DS. Use of complementary therapies by patients with IBD may indicate psychosocial distress. Inflammatory Bowel Diseases 2002; 8: 174-179.

13. Ax S, Gregg VH, Jones D. Chronic fatigue syndrome: Sufferers' evaluation of medical support. Journal of the Royal Society of Medicine 1997; 90: 250-254.

14. Dobkin PL, De Civita M, Bernatsky S, Kang H, Baron M. Does psychological vulnerability determine health-care utilization in fibromyalgia? Rheumatology 2003; 42: 1324-1331.

15. Conroy RM, Siriwardena R, Smyth O, Fernandes P. The relation of health anxiety and attitudes to doctors and medicine to use of alternative and complementary treatments in general practice patients. Psychology, Health, and Medicine 2000; 5: 203-212.

16. Davidson R, Geoghegan L, McLaughlin L, Woodward R. Psychological characteristics of cancer patients who use complementary therapies. Psycho-Oncology 2005; 14: 187-195.

17. Sollner W, Maislinger S, DeVries A, Steixner E, Rumpold G, Lukas P. Use of complementary and alternative medicine by cancer patients is not associated with perceived distress or poor compliance with standard treatment but with active coping behavior: A survey. Cancer 2000; 80: 873 - 880.

18. Kelner M, Wellman B. Who seeks alternative health care? A profile of users of five modes of treatment. The Journal of Alternative and Complementary Medicine 1997; 3: 127-140.

19. Truant T, Bottorff JL. Decision making related to complementary therapies: A process of regaining control. Patient Education and Counseling 1999; 38: 131-142.

20. Sparber A, Bauer L, Curt G, Eisenberg D, Levin T, Parks S, Steinberg SM, Wootton J. Use of complementary medicine by adult patients participating in cancer clinical trials. Oncology Nursing Forum 2000; 27: 623-630.

21. Swartzman LC, Harshman RA, Burkell J, Lundy ME. What accounts for the appeal of complementary/alternative medicine, and what makes complementary/alternative medicine "alternative"? Medical Decision Making 2002; 22: 431-450.

22. Kaboli PJ, Doebbeling BN, Saag KG, Rosenthal GE. Use of complementary and alternative medicine by older patients with arthritis: A population-based study. Arthritis Care & Research 2001; 45: 398-403.

23. Rao JK, Mihaliak K, Kroenke K, Bradley J, Tierney WM, Weinberger M. Use of complementary therapies for arthritis among patients of rheumatologists. Annals of Internal Medicine 1999; 131: 409-416.

24. Boisset M, Fitzcharles MA. Alternative medicine use by rheumatology patients in a universal health care setting. Journal of Rheumatology 1994; 21: 148-152.

25. Ganguli SC, Cawdron R, Irvine EJ. Alternative medicine use by Canadian ambulatory gastroenterology patients: Secular trend or epidemic? American Journal of Gastroenterology 2004; 99: 319-326.

26. Yeh GY, Eisenberg DM, Davis RB, Phillips RS. Use of complementary and alternative medicine among persons with diabetes mellitus: Results of a national survey. American Journal

of Public Health 2002; 92: 1648-1652.

27. Nayak S, Matheis RJ, Schoenberger NE, Shiflett SC. Use of unconventional therapies by individuals with multiple sclerosis. Clinical Rehabilitation 2003; 17: 181-191.

28. Egede LE, Ye X, Zheng D, Silverstein MD. The prevalence and pattern of complementary and alternative medicine use in individuals with diabetes. Diabetes Care 2002; 25: 324-329.

29. Verhoef MJ, Sutherland LR, Brkich L. Use of alternative medicine by patients attending a gastroenterology clinic. Journal of the Canadian Medical Association 1990; 142: 121-125.

30. Smart HL, Mayberry JF, Matkinson M. Alternative medicine consultations and remedies in patients with the irritable bowel syndrome. Gut 1986; 27: 826-828.

31. McEachrane-Gross F, Liebschutz J, Berlowitz D. Use of selected complementary and alternative medicine (CAM) treatments in veterans with cancer or chronic pain: a cross-sectional survey. BMC Complementary and Alternative Medicine 2006; 6: 34.

32. Druss BG, Rosenheck RA. Association between use of unconventional therapies and conventional medical services. Journal of the American Medical Association 1999; 282: 651-656.

33. Paramore LC. Use of alternative therapies: Estimates from the 1994 Robert Wood Johnson Foundation National Access to Care Survey. Journal of Pain and Symptom Management 1997; 13: 83-9.

34. Ni H, Simile C, Hardy AM. Utilization of complementary and alternative medicine by United States adults: Results from the 1999 National Health Interview survey. Medical Care 2002; 40: 353-358.

35. Sirois FM. Treatment seeking and experience with complementary/alternative medicine: A continuum of choice. Journal of Alternative and Complementary Medicine 2002; 8: 127-134.

36. Burgmann T, Rawsthorne P, Bernstein CN. Predictors of alternative and complementary medicine use in inflammatory bowel disease: Do measures of conventional health care utilization relate to use? The American Journal of Gastroenterology 2004; 99: 889-893.

37. Li FX, Verhoef MJ, Best A, Otley A, Hilsden RJ. Why patients with inflammatory bowel disease use or do not use complementary and alternative medicine: A Canadian national survey. Canadian Journal of Gastroenterology 2005; 19: 567-573.

38. Singh H, Maskarinec G, Shumay DM. Understanding the motivation for conventional and complementary/alternative medicine use among men with prostate cancer. Integrative Cancer Therapies 2005; 4: 187-194.

39. Testerman JK, Morton KR, Mason RA, Ronan AM. Patients motivations for using complementary and alternative medicine. Complementary Health Practice Review 2004; 9: 81-92.

40. Ramos-Remus C, Watters CA, Dyke L, Suarez-Almazor ME. Assessment of health locus of control in the use of non-conventional remedies by patients with rheumatic disease. The Journal of Rheumatology 1999; 26: 2468-2473.

41. Rawsthorne P, Shanahan F, Cronin NC, Anton PA, LÃ¶fberg R, Bohman L, Bernstein CN. An international survey of the use and attitudes regarding alternative medicine by patients with inflammatory bowel disease. American Journal of Gastroenterology 1999; 94: 1298-303.

42. Risberg T, Jacobsen BK. The association between mental distress and the use of alternative medicine among cancer patients in North Norway. Quality of Life Research: An International Journal of Quality of Life Aspects of Treatment, Care & Rehabilitation 2003; 12: 539-544.

43. Paltiel O, Avitzour M, Peretz T, Cherny N, Kaduri L, Pfeffer RM, Wagner N, Soskolne V. Determinants of the use of complementary therapies by patients with cancer. Journal of Clinical

Oncology 2001; 19: 2439-2448.

44. Kelner M, Wellman B. Health care and consumer choice: Medical and alternative therapies. Social Science & Medicine 1997; 45: 203-212.

45. Furnham A, Beard R. Health, just world beliefs and coping style preferences in patients of complementary and orthodox medicine. Social Science & Medicine 1995; 40: 1425-1432.

46. Sirois FM, Gick ML. An investigation of the health beliefs and motivations of complementary medicine clients. Social Science and Medicine 2002; 55: 1025-1037.

47. Cameron L, Leventhal EA, Leventhal H. Symptom representation and affect as determinants of care seeking in a community-dwelling, adult sample population. Health Psychology 1993; 12: 171-179.

48. Sirois FM, Purc-Stephenson R. The same….but different: Factors associated with in-person and on-line support group use across three chronic illness groups. Canadian Psychology 2006; 47: 81 (Abstract).

49. Gignac MA, Cott C, Badley EM. Adaptation to chronic illness and disability and its relation to perceptions of independence and dependence. Journal of Gerontology 2000; 55B: 362-372.

50. Sirois FM, Davis CG, Morgan MS. "Learning to live with what you can't rise above": Control beliefs, symptom control, and adjustment to tinnitus. Health Psychology 2006; 25: 119-123.

51. Sirois FM. The Control beliefs inventory. Unpublished manual, 2002.

52. Wallston KA, Wallston BS, DeVellis R. Development of the multidimensional health locus of control (MHLC) scales. Health Education Monographs 1978; 6: 160-170.

53. Carver CS, White TL. Behavioral inhibition, behavioral activation, and affective responses to impending reward and punishment: The BIS/BAS scales. Journal of Personality and Social

Psychology 1994; 67: 319-333.

54. Millar WJ. Patterns of use – alternative health care practitioners. Health Reports 2001; 13: 9–21.

55. Sirois FM. Researching hard to access chronic illness groups: Bridging the accessibility gap with Internet-based research. Canadian Psychology 2004; 45: 104 (Abstract).

56. Krantz JH, Dalal R. Validity of web-based psychological research. In: Birnbaum MH, ed. Psychological experiments on the Internet. San Diego: Academic Press, 2000.

57. Bausell RB, Lee WL, Berman BM. Demographic and health-related correlates to visits to complementary and alternative medical providers. Medical Care 2001; 39: 190-6.

58. Spence M, Ribeaux P. Complementary and alternative medicine: Consumers in search of wellness or an expression of need by the sick? Psychology and Marketing 2004; 21: 113-139.

59. Suarez T, Reese FL. Coping, psychological adjustment, and complementary and alternative medicine use in persons living with HIV and AIDS. Psychology & Health 2000; 15: 635-649.

60. Langhorst J, Anthonisen IB, Steder-Neukamm U, Luedtke R, Spahn G, Michalsen A, Dobos GJ. Patterns of complementary and alternative medicine (CAM) use in patients with inflammatory bowel disease: Perceived stress is a potential indicator for CAM use. Complementary Therapies in Medicine In press.

61. Hilsden RJ, Verhoef MJ, Best A, Pocobelli G. Complementary and alternative medicine use by Canadian patients with inflammatory bowel disease: Results from a national survey. The American Journal of Gastroenterology 2003; 98: 1563-1568.

62. Bishop FL, Yardley L. Constructing agency in treatment decisions: Negotiating responsibility in cancer. Health 2004; 8: 465-82.

63. Thorne S, Paterson B, Russell C, Schultz A. Complementary/alternative medicine in chronic

illness as informed self-care decision making. International Journal of Nursing Studies 2002; 39: 671-683.

64. Balneaves LG, Kristjanson LJ, Tataryn D. Beyond convention: Describing complementary therapy use by women living with breast cancer. Patient Education and Counseling 1999; 38: 143-153.

65. Honda K, Jacobson JS. Use of complementary and alternative medicine among United States adults: The influences of personality, coping strategies, and social support. Preventive Medicine 2005; 40: 46– 53.

Table 1. Demographic characteristics stratified by chronic illness group.

	Illness group			
	Total sample	Arthritis	IBD	Mixed chronic
N	365	140	110	115
Sex (% female)	79.5	80.6	75.5	81.9
Age				
Mean (SD)	39.00 (11.34)	41.98 (9.92)	35.61 (11.42)	38.58 (12.00)
Range	16-71	18-66	16-62	16-71
Ethnicity (% Caucasian)	93.3	91.7	97.1	91.7
Country (%)				
Canada	25.8	39.1	27.3	8.0
United States	61.9	52.9	54.5	80.4
United Kingdom	5.8	4.3	10.0	3.6
Australia	4.4	3.6	4.5	5.4
Europe	1.4	0	3.6	0.9
Other	0.6	0	0	1.8
Employment status (%)				
Full-time	40.1	43.6	45.5	30.7
Part-time	15.4	10.0	15.5	21.9
Unemployed/retired	23.6	22.9	23.6	24.6
Disabled	20.9	23.6	15.5	22.8
Education (%)				
High school or less	15.8	13.8	19.6	14.8
Undergraduate university	61.9	67.4	58.9	58.3
Graduate school	22.2	18.8	21.5	27.0
Relationship status (%)				
Married	61.1	72.9	56.4	50.9
Separated/Divorced/Widowed	12.6	10.7	10.9	16.7
Never married	26.4	16.4	32.7	32.5

Note: IBD = Inflammatory bowel disease

Table 2. Mean number of consultations with different complementary and alternative medicine (CAM) providers stratified by illness group among the CAM client group.

Type of CAM	Total sample of CAM users (N = 139; 38.1%)	Illness Group		
		Arthritis (N = 51; 36.4%)	IBD (N = 35; 31.8%)	Mixed Chronic (N = 53; 46.1%)
	Mean consultations (SE)	Mean consultations (SE)	Mean consultations (SE)	Mean consultations (SE)
Chiropractic	3.31 (.72)	4.16 (1.40)	1.83 (.98)	3.52 (1.17)
Massage therapy	4.13 (.82)	5.34 (1.51)	3.21 (2.11)	3.62 (.75)
Naturopathy/Homeopathy	0.68 (.18)	0.24 (.11)	1.09 (.40)	0.85 (.38)
Other CAM including acupuncture	1.27 (.31)	1.08 (.43)	1.15 (.77)	1.52 (.48)

Note: IBD = Inflammatory bowel disease

Table 3. Mean number of consultations made to conventional health-care providers and proportion of patients consulting various conventional health-care providers in the previous six months compared across clients who use (N = 139) and do not use (N = 226) complementary and alternative medicine (CAM). Tests of mean differences were conducted while controlling for differences in acute (M = 4.66) and chronic (M = 3.34) health problems.

Health-care service	Proportion of clients consulting		χ^2	Number of consultations		F
	NCAM % (N)	CAM % (N)		NCAM M (SE)	CAM M (SE)	
General Practitioner	84.5 (191)	92.8 (129)	5.48*	4.07 (.41)	4.02 (.51)	0.00
Specialist	82.7 (187)	82.0 (114)	0.03	3.61 (.31)	3.21 (.40)	0.62
Hospital ER	32.7 (74)	36.7 (51)	0.60	0.58 (.10)	0.71 (.13)	0.54
Nutritionist/Dietician	8.8 (20)	23.0 (32)	14.15**	0.14 (.06)	0.42 (.08)	7.13**
Counselor/Psychologist	17.3 (39)	28.1 (39)	5.98**	1.15 (.30)	1.72 (.38)	1.40
Psychiatrist	10.6 (24)	12.2 (17)	0.22	0.40 (.16)	0.65 (.20)	0.97
Physiotherapist	7.1 (16)	20.1 (28)	13.86**	0.66 (.29)	1.74 (.37)	5.27*
Dentist	59.7 (135)	65.5 (91)	1.20	0.99 (.09)	1.05 (.11)	0.16
Other health professional	15.0 (35)	20.9 (29)	1.72	0.82 (.17)	0.66 (.21)	0.39

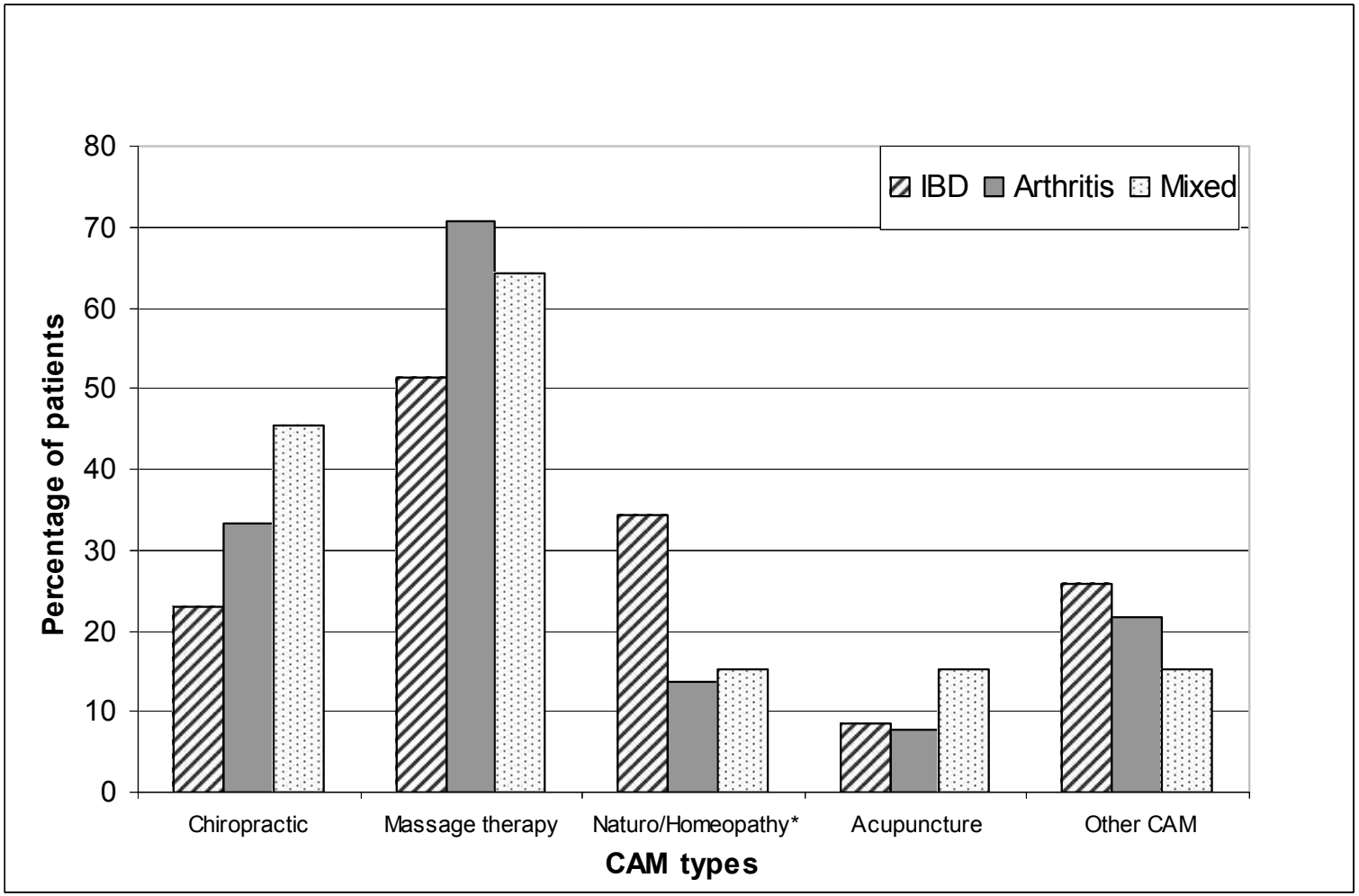
Note: NCAM = non-CAM clients; * = $p < .05$; ** = $p < .01$.

Table 4. Adjusted odds ratios (ORs) and 95% confidence intervals (95% CI) of factors independently associated with consulting CAM providers in the previous six months. Only significant factors remaining after the conditional backward step-wise removal are listed.

	OR	95% CI	*p*-value
Sex			
Female	2.60	1.39 - 4.87	0.003
Education			
High school	1.0		
College/University	2.17	1.09 – 4.32	0.028
Graduate school	3.44	1.56 – 7.63	0.002
Health			
Number of chronic health problems	1.19	1.05 – 1.34	0.006
Stress index	0.89	0.79 – 1.00	0.054
Individual differences			
Coping efficacy - emotional	0.65	0.53 – 0.79	0.000
Reward responsiveness	1.56	1.01 – 2.39	0.044
General health control	1.47	1.15 – 1.89	0.002
Chance health control	0.81	0.65 – 0.99	0.043

Figure 1: Percentage of patients who used various types of complementary and alternative medicine (CAM) stratified by chronic illness group.

Note: * = significant chi-square test at $p < .05$.


80
70
60
50
40
30
20
10
0
Percentage of patients
IBD
Arthritis
Mixed
Chiropractic
Massage therapy
Naturo/Homeopathy*
Acupuncture
Other CAM
CAM types