COMPLEMENTARY AND ALTERNATIVE MEDICINE USE BY CANADIAN UNIVERSITY STUDENTS

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ABSTRACT

Background
Studies investigating Complementary and Alternative Medicine (CAM) prevalence are outdated and are generalized across different demographic groups due to their national scope. Determining trends among specific populations is necessary to gain insight into the growing popularity of CAM.

Objectives
To determine the prevalence and factors associated with CAM use among Canadian university undergraduate students and to determine student views regarding CAM research, education and policy-making decisions.

Methods
Two arbitrarily selected undergraduate student classes at Queen's University were surveyed for this cross-sectional descriptive study. Information was provided by 128 respondents via questionnaire (75% response rate) on key demographics, CAM use and satisfaction with mainstream Canadian healthcare. Upon completion of the survey, voluntary participation was requested for the interview portion resulting in 7 semi-structured qualitative interviews.

Results
Of the 128 participants, 90 (70%) claimed to be users of at least one CAM modality. Female gender was strongly associated with CAM use ($p<0.001$). Other characteristics that may be correlated include being enrolled in a health-related academic program, being dissatisfied with certain aspects of the healthcare system and having parents who use CAM. The majority of respondents desired more research and education on CAM and more collaboration between the two healthcare streams.

Conclusions
Canadian university undergraduate students are active CAM users and interest in CAM is high among this population. Further investigation is required to ensure that students are using CAM safely and appropriately.

Key words: *CAM use, complementary and alternative medicine, student health*

Health Canada has defined Complementary and Alternative Medicine (CAM) as the "diagnosis, treatment and/or prevention that complements mainstream medicine by contributing to a common whole, by satisfying a demand not met by conventional approaches, or by diversifying the conceptual framework of medicine".[1]

Prevalence of CAM Use
The 2002 United States National Health Interview Survey (NHIS) included a supplemental

questionnaire on Alternative Health/Complementary and Alternative Medicine.[2] The 31,044 participants were asked about their use (ever or within the past 12 months) of 27 different CAM modalities, including CAM diets, mind-body therapies and use of prayer for health purposes. The study found that 75% of adults age 18 or over have used some form of CAM therapy in their lifetime, and 62% when prayer was included in the definition in the past 12 months. Females were more likely to use CAM therapies than males, and no correlation between higher education and CAM use was observed. Once prayer for health purposes was excluded, CAM usage was found to have an inverse "U" relationship with age for most modalities. This user profile was similar to Eisenberg's findings that users tended to be between 35 to 40 years in age, but differed in that users were more likely to possess a college education and have an annual income over $50,000.[3,4]

In a 2000 Australian study, 518 university students were surveyed on their CAM use.[5] The results indicated an even higher usage. Eighty-one percent of participants used at least one CAM modality, with relaxation techniques and massage therapy being the most common. CAM was once again most often used by females but in this population was more often used for such health concerns as headaches, cold and flu, stress and allergies, instead of the musculoskeletal concerns seen in the previous population. Students tended to cite use of CAM therapies for lifestyle, availability and holistic approach more frequently than due to dissatisfaction with conventional care.[5]

In 2006, the Fraser Institute conducted a follow-up to its 1999 study.[6] In 1999, Ramsay conducted the biggest study of CAM use in the Canadian setting, where telephone interviews were conducted with 1,500 randomly selected persons aged 18 years or older.[7] The study found that 73% of participants had used at least one form of alternative therapy at some point in their lifetime and 50% of participants had done so within the past 12 months. This percentage was higher than the one obtained by the Angus Reid Group, who found in 1998 that 42% of Canadians used CAM, of whom one-fifth began their CAM use within the past five years.[8] Ramsay's 2006 follow-up study[6] found a user profile consistent with Barnes' American survey[2] in that income did not seem to be a factor in alternative therapy use, but differed in that those with some post-secondary education used more alternative therapies than those with less than a high school education. Ramsay's study also found that participants aged 18 to 24 years were most likely to have used alternative therapies in the last 12 months.

Although previous studies have indicated high prevalence of CAM use in many developed nations, confusion remains about predictors of CAM use. Some studies have indicated a higher prevalence amongst higher socioeconomic classes or education levels, while others have not. This study will provide some insight into how Canadian students compare to the general population in terms of CAM usage and attitudes.

This study is novel in that it combines both qualitative and quantitative research methodology, which improves the validity and depth of the results.[9] It is also novel in its investigation of additional potential predictors of CAM use. Although dissatisfaction with the healthcare system as a predictor of CAM use has been analyzed in the US[10], it has never been investigated in a Canadian context.

METHODS

This study was reviewed and approved by the Queen's University Health Sciences and Affiliated Teaching Hospitals Research Ethics Board.

Part I: Survey

The survey population was Queen's University undergraduate students in Kingston, Ontario during the academic year 2005-2006. Cluster sampling was used since a complete list of students was unavailable. Cluster sampling is a method whereby participants are selected collectively through natural groupings, such as academic classes as in this study. Undergraduate classes at Queen's University were arbitrarily selected and professors were asked permission to conduct the survey during the first 15 minutes of class. The first two teacher-approved classes of size greater than 50 students were surveyed. This method of sampling minimized volunteer bias since surveys were conducted at the beginning of

regularly scheduled lectures. The survey developed for this project consisted of two main thematic sections, as well as demographic data collection.

1. CAM Usage

CAM use data was collected by asking participants how frequently (at least once a week, at least once a month, once or twice a year, or never) they used the following alternative therapies: acupuncture, aromatherapy, ayurveda, botanical/herbal medicine, chiropractic, dietary supplements, homeopathic medicine, hydrotherapy, massage therapy, mind-body therapy, osteopathic medicine, reflexology, reiki, tai chi, traditional Chinese medicine, and yoga. The therapies were selected to provide a broad spectrum of modalities. Space was provided for participants to indicate use of other therapies that were not listed. Participants were also questioned about the number of years they had used the therapies and their annual spending to obtain a complete usage profile.

2. Satisfaction with Mainstream Healthcare

Satisfaction with mainstream healthcare was measured looking at attitudes towards family physicians as well as the healthcare system in general. A 9-item measure was used to assess participant satisfaction with family physicians. The items addressed a variety of issues including: trust, knowledge, approachability and monetary/time constraints. Levels of satisfaction were determined using 4-level frequency scales for each item. A 7-item measure was used to assess participant satisfaction with the Canadian Healthcare System (CHS) as a whole. The items addressed issues including: efficiency, prevention and effectiveness of treatments. The levels of satisfaction for these items were determined using a five-point Likert scale (strongly agree to strongly disagree). The survey questions were created for this study. The questions were piloted with a sample of 20 arbitrarily selected student volunteers and revised accordingly prior to administering survey to the study participants.

Other data were obtained in regards to participant views on CAM research, education and policy-making decisions. Comments were solicited regarding reasons for and against CAM use. Statistics were generated with SPSS 12.0 for Windows (SPSS, Inc). Pearson chi-squared tests for independence were used to analyze differences in demographic factors and healthcare satisfaction rates between CAM users and non-users. Differences with a p-value less than 0.05 were considered statistically significant.

Part II: Interviews

Interviews were conducted as a follow-up to the survey for study participants who were willing to donate 15 to 30 minutes of their time. Semi-structured interviews were conducted, in which participants were asked to discuss their experiences with CAM use and the CHS, as well as their health status and parental use of CAM. Notes were taken throughout the interviews and each idea expressed was recorded. Qualitative data analysis was subsequently performed with manual coding of the interviews. Key themes were tabulated and both trends and differences in responses were noted.

RESULTS

Part I: Survey

Two Queen's University undergraduate classes were surveyed between February and March 2006 resulting in a total of 128 respondents. The first was a third-year nutrition night class. There were 178 students registered in the course, approximately 105 in attendance and 81 surveys collected (77% response rate). The second was a second-year history class with 125 students, approximately 65 in attendance and 47 responses (72% response rate). The overall response rate for the survey was approximately 75%. Baseline characteristics of survey respondents are provided in Table 1. For some of the items there are missing data because no responses were provided.

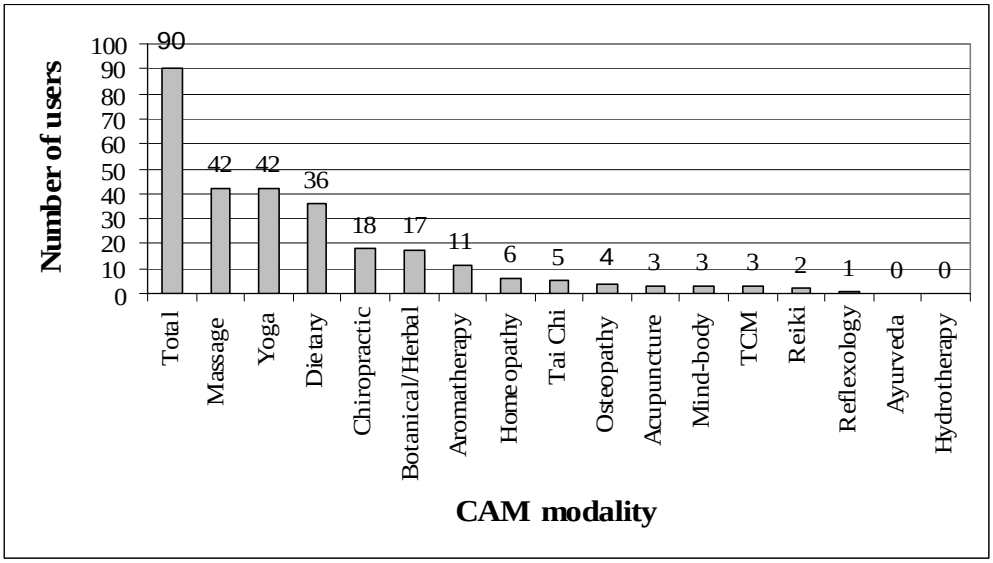
TABLE 1 Baseline Characteristics of Survey Respondents (n=128)

Gender	Female	103 (80.5%)
	Male	25 (19.5%)
Religion	Christian	78 (60.9%)
	Hindu	1 (0.8%)
	Jewish	3 (2.3%)
	Muslim	1 (0.8%)
	Multiple	1 (0.8%)
	Non-practicing	35 (27.3%)
Ethnicity	European	85 (66.4%)
	Asian	9 (7.0%)
	Black/Caribbean	1 (0.8%)
	Mixed ethnic	7 (5.5%)
Age (years)	18-19	18 (14.1%)
	20-21	73 (57%)
	22-23	32 (25%)
	>23	5 (3.9%)
Program of study	Health-related	74 (57.8%)
	Non health-related	49 (38.3%)
Year of study	2	25 (19.5%)
	3	67 (52.3%)
	4	35 (27.3%)
Place of birth	Canada	118 (92.2%)
	Other	10 (7.8%)
Parental place of birth	Canada – both	93 (72.7%)
	Other	34 (26.6%)

CAM Usage

Of the 128 participants, 70% identified themselves as CAM users in some capacity. Yoga and massage therapy were the most commonly used therapies (Figure 1). The total amount spent on CAM per year among all respondents was $11,570. Among respondents reporting to have spent any amount, this equated to an average of $192.83 per year.

FIG. 1 CAM Use Among Queen's University Undergraduate Student Participants (n=128)



The classes that were sampled differed significantly in terms of CAM use (Table 2). The two undergraduate classes differed significantly in general use (p=0.005), CAM spending per year (p=0.025) and number of years of use (p=0.046), with the health class participants being the more avid users. Gender and program of study were the only differences observed between the classes for any of the baseline characteristics described in Table 1. There were no differences between the classes in terms of any of the 9 indicators of physician satisfaction. Of the 7 indicators of CHS satisfaction, the classes differed significantly (p= 0.008) in terms of their satisfaction with promotion of healthy lifestyle. There was a trend to greater dissatisfaction in the health class participants about the CHS provision of necessary services and prevention of future medical problems.

TABLE 2 Between-class Comparison of CAM Use, Baseline Characteristics and Health Care Satisfaction

		History class (n=47)	Health class (n=81)	p-value
General use	User	26 (55.3%)	64 (79%)	0.005*
CAM spending ($/yr)	0	22 (46.8%)	21 (25.9%)	0.025*
	≤ 100	10 (21.3%)	20 (24.7%)	
	>100	5 (10.6%)	21 (25.9%)**	
Years of CAM use	0	21 (44.7%)	17 (21.0%)	0.047*
	1-3	7 (14.9%)	15 (18.5%)	
	> 3	7 (14.9%)**	19 (23.5%)**	
Gender	Female	29 (61.7%)	74 (91.4%)	<0.001*
Program of study	Health-related	4 (8.5%)	70 (86.4%)	<0.001*
CHS provision of necessary treatments	Satisfied	35 (74.5%)	47 (58.0%)	0.062
CHS promotion of healthy lifestyle	Satisfied	42 (89.4%)	55 (68.8%)	0.008*
CHS prevention	Satisfied	34 (72.3%)	45 (55.6%)	0.06

* statistically significant ** low item response rate (<80%)

CAM users were more likely to be female (p<0.001) (Table 3). Differences of interest that did not reach statistical significance included: lack of access to family physicians (p=0.063), dissatisfaction with the amount of time family physicians spend with their patients (p=0.081), lack of treatment options provided by family physicians (p=0.091) and being enrolled in a health-related program (p=0.098).

TABLE 3 Factors Associated with CAM Use

		User (n=90)	Non-user (n=38)	p-value
Gender	Female	80 (88.9%)	23 (60.5)	<0.001
Program of study	Health-related	57 (63.3%)	17 (44.7%)	0.098
Difficulties accessing a family physician	No	74 (82.2%)	36 (94.7%)	0.063
Provision of treatment options by family physicians	Satisfied	47 (52.2%)	26 (68.4%)	0.091
Amount of time family physicians spend with patients	Satisfied	51(56.7%)	28 (73.7%)	0.081

Satisfaction with Mainstream Healthcare

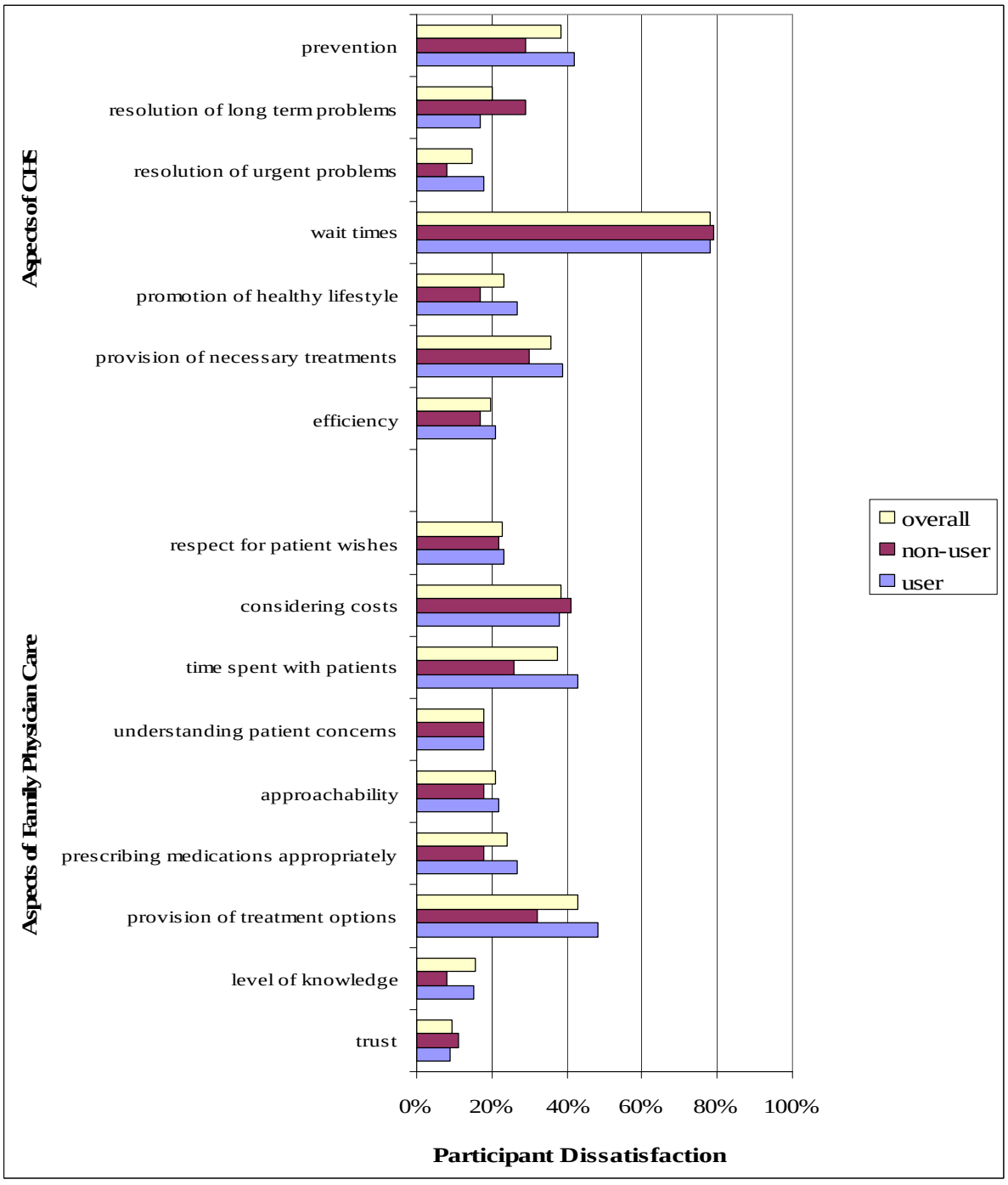
While rates of overall dissatisfaction with the Canadian Healthcare System (CHS) tended to be higher among users than non-users (Figure 2), dissatisfaction with family physicians was generally not reported. It was noted that only 18 (14.1%) participants reported difficulties in accessing family physicians. Only 9% expressed distrust in their family physicians, 18% felt that their family physicians misunderstood their concerns, and 16% were uncertain of the level of knowledge of their family physicians. However, 43% felt they were not given all their treatment options, only 38% felt that costs were considered in treatment decisions and 38% felt that their family physicians did not spend enough time with their patients. Although only 15% felt that the CHS was ineffective in handling urgent medical problems, 78% felt that wait times were inappropriate, 38% felt that the CHS was inactive in the prevention of illnesses and 36% felt that the CHS does not provide all necessary treatments.

Attitudes Towards CAM

The majority of respondents had positive attitudes towards CAM research with only 11% seeing no use for further research. Acupuncture (48%), botanical/herbal remedies (44%) and chiropractic (38%) were the modalities that were most often requested for further investigation. Most respondents also believed that there should be some form of collaboration between CAM providers and the CHS, with only 12% indicating that no collaboration is required. Sixty-nine percent believed that physicians should refer patients to CAM as they see fit, 65% believed that physicians should be more informed about CAM and 52% believed some CAM should be funded by the CHS. However, only 8% of respondents believed that all CAM should be funded by the CHS. Physicians (57%) and books, newspapers and journal articles (48%) were the preferred source of information for most participants. However, the main sources of information on CAM among participants were friends (48%) and family members (43%).

A health problem was the most commonly cited reason for alternative therapy use (40%), followed by relaxation (30%) and nutrition (24%). A smaller number of CAM users provided prevention (8%) as a reason. Being healthy (43%), lack of access or finances (12%), disbelief in efficacy (8%) and lack of interest (8%) were the main reasons given by those who did not use CAM therapies.

FIG. 2 Participant Dissatisfaction with Various Aspects of Healthcare as a Function of CAM Use



Part II: Interviews

Of the 128 students surveyed, 21 volunteered for the interview portion of the study; however, upon further contact only seven of those students were available. The participants were between the ages of 19 and 22 years, three were male and five were enrolled in health-related programs.

TABLE 4 Trends Observed among Interview Participants

CAM usage	Health status	Parental CAM usage	Experiences with CHS
Non-user	Illness	Non-users	Positive
Non-user	Joint problems	Non-users	Positive
User	Healthy	Users	Negative
User	Anemic	Users	Mixed
Non-user	Healthy	Non-users	Positive
User	Healthy	User/Non-user	Positive
User	Prior hip flexor problems; now healthy	User/Non-user	Positive

As seen in Table 4, four of the seven interview participants claimed to be CAM users. However, lines were often blurred between users and non-users. For example, one of the participants who identified herself as a non-user stated that she did use herbs to ward off colds and took vitamins for health maintenance. Another non-user claimed that he would shortly begin taking supplements to prevent illnesses for which he has a known family history. Of the four users, two stated that they regard their usage as conventional since therapies such as dietary supplements, yoga and massage have been widely regarded as beneficial by mainstream health providers.

Although health status was the most commonly cited reason both for and against CAM use in the survey, no link was observed between health status and alternative therapy use during the interviews. In all cases, participant usage status mirrored that of their parents, in that users had one or both parents who used CAM and the parents of non-users did not use CAM. All three of the CAM non-users had positive experiences with the CHS. the users of CAM, on the other hand, were more varied in their experiences with the CHS. The main reasons against CAM use expressed by non-users were a lack of information and a lack of trust or belief in efficacy. The main reasons for CAM usage cited by users were physical benefit (exercise/flexibility/core strength/lean muscle mass), relaxation, vitamin supplementation and prevention of colds. One participant claimed to use CAM to cure a medical problem.

DISCUSSION

Major findings included a high prevalence of CAM use in this subject cohort and a strong association between female gender and CAM use. The majority of respondents desired more research and education on CAM and more collaboration between the two healthcare streams. One major limitation of this study was that only 16 CAM modalities were investigated. Although the modalities were purposely chosen to include a broad array of therapies and participants were able to indicate use of other therapies, modalities were likely missed since there are over 4000 in existence.[1] One of the problems with comparing studies of CAM, is that what constitutes CAM and is included in the definition varies significantly.

The lifetime prevalence of CAM use (70%) we found in this study was similar to the NHIS findings for any CAM including prayer (75%), the Australian university study (81%), and the general Canadian population (73%).[2,5,7] The Australian study notably had a biased sample with predominantly female students (76%) from the fields of study of psychology, education and nursing. Our findings may also overestimate the prevalence of use for these modalities among all Queen's University undergraduate students since the study sample was composed mostly of females enrolled in health-related programs. Nonetheless, even the history class, which had a more equivalent gender distribution and far fewer health-related students, had a CAM-use prevalence of 55%. The prevalence rates are consistent with previous findings stating that people with higher education and socio-economic

status were more likely to be CAM users.[3,4] As Feldman suggests, university and college students are more likely to be early adopters of innovative health practices.[5] Our findings are consistent with a secular trend to increased CAM use in the Canadian context.

The students also differed from the general population in terms of CAM modality choices. Chiropractic is the most frequently used CAM modality used by the general population[6], while yoga and massage therapy were the most common forms of therapy used in this population. One possible explanation for this discrepancy could be related to health needs. Students tend to have high levels of stress, whereas users in the general population may tend to have more chronic musculoskeletal problems. Age and finances could also play a factor in the choice of CAM modalities.

Female gender has been associated with CAM use in virtually every study conducted to date.[2-5,7] Other potential correlations, which were not statistically significant included, being enrolled in a health-related academic program, being dissatisfied with certain aspects of the healthcare system and having parents who use CAM. The correlations between gender, academic program of study and satisfaction with the healthcare system and CAM use were reinforced when CAM users and non-users were compared on a variety of factors. When CAM users were compared to non-users, the users tended to be more dissatisfied with access to family physicians, the amount of time family physicians spend with their patients and with the treatment options provided by family physicians. There does appear to be a relationship since users of CAM tended to be more dissatisfied than non-users.

Dissatisfaction with the healthcare system has not previously been investigated as a possible predictor of CAM use in Canada. Astin found no association between dissatisfaction with healthcare and CAM use in the US.[10] One possible explanation for the lack of association between healthcare dissatisfaction and CAM use in the US could be, if users of CAM tend to be of higher socio-economic status[3,4], they are not as limited by financial barriers when attempting to access a range of health services. Barnes found in the NHIS that adults tended to use CAM therapies in conjunction with conventional medicine, while 28% felt that conventional medicine could not help them with their health problems.[2] Dissatisfaction with mainstream healthcare may be associated with CAM use in Canada because of the lack of a two-tier system. It is possible that higher-income CAM users have the financial means to seek these services when dissatisfied with wait times or primary care access in the public sector.

Our interview results suggest that CAM use may be associated with dissatisfaction with the healthcare system. The CAM users that were interviewed had mixed experiences with the CHS while non-users had positive experiences. Parental use of CAM mirrored use among respondents of the interviews. This finding is consistent with the conclusion of Verhoef, that CAM users tend to be clustered in families.[11] Although the most common reason for using CAM indicated by respondents of the survey was a health problem, no relationship between health status and CAM use appeared to be present from the interviews. This may have been due to the small number of interviews conducted, as well as the relatively healthy status of this population.

A larger scale investigation using random sampling would be important to confirm the validity of specific predictors of CAM use, particularly in regards to dissatisfaction with the CHS, found in this study. Utilizing a larger and more heterogeneous study population, one could explore how specific religious and ethnic backgrounds influence both healthcare satisfaction as well as CAM use.

It is clear from this investigation that even with a higher overall health status relative to the general population, Canadian undergraduate students are substantial consumers of CAM therapies. It also appears that certain therapies such as yoga, massage and dietary supplements are progressively becoming incorporated into the mainstream leading to some confusion as to what constitutes CAM. There is continued need and demand for education among university students through more formalized means such as physicians, journals or classroom learning. Such education is important to ensure that students engage in safe and effective CAM choices.

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