

HERBAL REMEDIES OR CONVENTIONAL MEDICINES: HOW DO STUDENTS CHOOSE?

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ABSTRACT

Background

With the increasing popularity of herbal remedies, the objectives of this study are to investigate the interrelationships among knowledge, attitudes and usage; and to compare factors related to reliance on herbals versus conventional medicines by university students.

Methods

University Ethics Review Board approved the study. The validated questionnaire was administered to a convenience sample of 318 students from randomly selected university classes in February 2001. Descriptive summaries of knowledge, attitude and usage were obtained and four indexes were compiled and inter-correlated. Characteristics of users and non-users of herbals were contrasted.

Results

The participants were mostly female with an average age of 20.2 years. Most practiced a healthy lifestyle and were fairly satisfied with their present state of health. Both perceived and actual knowledge (modest to thorough) results were higher for conventional medicines than herbals. Ninety-eight percent of students use or have used conventional medicines as compared to 70% for herbals. Fifty-five percent of all respondents and 63% of current users of herbals indicated that they are more likely to use herbals in the future. Most supported integration of herbals with conventional medical care but 44% had no opinion on herbals having the same medical status as conventional medicines.

Interpretation

A higher reliance on self-medication indicates students' desire to take greater control of their own health care. A dramatic prediction for future use, along with an unwillingness to consult doctors and a low level of knowledge on herbal remedies, potentiates health hazards from dangerous side effects and adverse reactions.

Key Words: herbal remedies, integrative health care

INTRODUCTION

The increasing popularity of herbal remedies has been well documented.¹⁻⁵ A 1999 survey reported that 17% of Canadians have used herbal remedies over their lifetime with an average annual expenditure of \$134.77.⁶ A rapid growth in herbal usage, from 15% to 33.3% between 1996 and 1998, has been reported for the Canadian population;⁷ this is similar to what is being seen in the American population.⁸ Herbal remedy use among younger people is also on the rise.^{9,10} The most prevalent users of herbals are people in their middle age and older,^{4,11-14} citing treatment of chronic health problems as the most common reason for use.^{8,14,15} While much attention has been focussed on the use of herbal remedies by a more mature population, few studies have been done on younger groups.^{10,16} Although these studies provide valuable information on the prevalence and the extent of herbal usage by university students, there is a need to study factors related to usage by younger people in the population.

The objectives of this present study are to investigate the levels and interrelationships among knowledge, attitudes and usage and to compare and contrast factors related to reliance on herbal remedies versus conventional medicines by university students.

METHODS

The study was approved by the University Ethics Review Board. A closed-ended questionnaire was pilot tested on 50 students in November 2000 for readability, clarity and ease of administration. The

validated questionnaire was administered to a convenience sample of 318 students from randomly selected university classes in February 2001.

Survey questions were based on variables identified from sources cited in the literature and from experience of the researchers, providing face validity. Questions on knowledge were in the “true/false” and “true/false/don’t know” formats and included questions on herbal remedies and conventional medicines. Attitudinal questions were presented on a six-point Likert scale (strongly agree to strongly disagree) to avoid a neutral central point. These questions were designed to determine attitudes towards herbal remedies, conventional medicines and an integrative approach to healthcare. Practice questions were designed to determine the frequency of usage of herbal remedies versus conventional medicines for common medical conditions. There were also general questions on family background, age, gender, education and lifestyle factors such as diet and physical activity.

Data from the returned questionnaires were analyzed for descriptive statistics using Microsoft® Excel 2000 (Microsoft Corporation, Redmond, WA) and SAS 6.12 (SAS Institute, Cary, NC). General and specific knowledge scores for herbal remedies and conventional medicines were determined. The “don’t know” responses were scored as wrong answers. Attitude questions were grouped according to their content, coded numerically and summed to compute attitude indexes for herbal remedies (HR-A), conventional medicines (CM-A), integrative health care (IH-A) and personal health (PH-A). Each index ranged in possible value from 0 to 100 and higher scores corresponded to stronger agreement with the positively worded questions comprising the index. Cronbach’s alphas were computed as a measure of internal validity. Correlation analysis was used to explore and identify relationships between attitude indexes. Knowledge and practice characteristics of users and non-users of herbals were contrasted.

RESULTS

General and health behavior characteristics of the students are presented in Table 1. The participants were mostly female with an average age of 20.2 years. The students’ family economic circumstance was described as middle income. Most of the students practiced a healthy lifestyle and were fairly satisfied with their present state of health.

Table 1 Distribution of General and Health Practice Characteristics of Students (n = 318)

Characteristic	% Frequency
Age (years)	
16 – 20	54.8
21 – 25	31.5
26 – 30	7.4
Over 30	6.3
Gender	
Male	16.0
Female	86.0
Years at university	
Less than 2	38.7
2 or 3	42.0
4, 5 or 6	17.2
More than 6	2.1
Exercise frequency/week	
Never	2.5
Two times or less	42.1
Three times or more	54.7
High fat consumption/week	
Never	3.5
Two times or less	70.1

Three times or more	25.8
Low fat substitute consumption/week	
Never	8.2
Two times or less	22.0
Three times or more	69.2
Fruit & vegetable consumption/week	
Never	0.6
Two times or less	19.2
Three times or more	79.6
Vitamin & mineral supplements/week	
Never	39.3
Two times or less	24.5
Three times or more	35.5
Satisfaction with present state of health	
Very satisfied	14.8
Fairly satisfied	65.4
Fairly dissatisfied	15.7
Very dissatisfied	3.5

Table 2 summarizes the general and specific knowledge of students. The overall correct general knowledge score on conventional medicines was 75.8%. Students scored lower on herbal remedies general knowledge. Slightly more than half of the specific questions on conventional medicines (56.8%) were answered correctly. Students were less knowledgeable about specific topics on herbal remedies as only 33.5% of the questions were correctly answered.

Table 2 Knowledge of Students Regarding Herbal Remedies and Conventional Medicines (n=318)

Knowledge Statement	Herbal Remedies	Conventional Medicines
	Correct Response % Correct ± SE	Correct Response % Correct ± SE
General *	66.1±0.8%	75.8±0.7%
Do not cause serious side effects	F 83.0% ± 2.1%	F 97.5% ± 0.9%
Can be taken in larger than recommended quantities	F 87.7% ± 1.8%	F 96.9% ± 1.0%
There is no need to consult your doctor before taking herbal products.	F 87.7% ± 1.8%	
No danger of reacting with other substances, causing a health hazard.	F 84.6% ± 2.0%	F 98.7% ± 0.6%
Standardized, effectiveness and safety tested.	F 53.1% ± 2.8%	T 87.7% ± 1.8%
Herbal remedies are not classified as drugs so cannot make claims for treating certain health conditions.	T 57.2% ± 2.8%	
Herbal products that have long tradition of use are deemed safe.	T 52.2% ± 2.8%	
Can be effective in treating life threatening illness, infections or congenital defects.	F 44.0% ± 2.8%	T 73.6% ± 2.5%
Specific*	33.5±1.2%	56.8±0.9%
Echinacea must be taken for 10 weeks or more to be effective against the common cold.	F 37.1% ± 2.7%	
Aspirin is effective for treating the cold virus.		F 71.7% ± 2.5%
Ginseng is taken to increase body energy and vitality.	T 76.4% ± 2.4%	
Viagra is taken to increase male vitality.		T 83.6% ± 2.1%
Laetrile is currently used to treat cancer.		F 1.9% ± 0.8%
Consumption of Feverfew can reduce the severity of migraine headaches.	T 13.8% ± 1.9%	
Penicillin is taken to reduce the severity of headaches		F 77.4% ± 2.4%
Ginkgo (Bai Guo) is effective for treating mild to moderate dementia	T 28.3% ± 2.5%	
Donepezil is effective for treating mild to moderate dementia		T 6.9% ± 1.4%
Antacids are good replacement for calcium		F 50.0% ± 2.8%
Tetracycline is an effective treatment for influenza.		F 21.4% ± 2.3%
St. John's Wort is effective as an antidepressant	T 43.7% ± 2.8%	
Prozac is effective as an antidepressant.		T 86.5% ± 1.9%
Regulated by the Food and Drug Act.	F† 19.5% ± 2.2%	T 68.6% ± 2.6%

* Mean correct responses ±SE

†False at the time survey was done. Regulation was introduced effective January 2004.

Characteristics of knowledge and practices are summarized in Table 3. Both perceived and actual knowledge (modest to thorough) results were higher for conventional medicines than herbals. Ninety-eight percent of students used conventional medicines seldom to continuously as compared to 71% for

herbal remedies. Cure for an illness was the main reason for using conventional medicines while prevention of illness and promotion of well-being was the main reason for using herbals. The top three choices for over-the-counter medicines were non-opioid painkillers, anti-inflammatory drugs and cold remedies. Antibiotics were the most used prescription drugs, while Echinacea, ginseng and St. John's wort were the three top choices for herbal remedies. A much higher proportion of students indicated that they would use herbal remedies more in the next five years than those who would use conventional medicines more.

Table 3 Student Knowledge and Practices about Herbal Remedies and Conventional Medicines (n=318)

Characteristic	Herbal Remedies (% Frequency)	Conventional Medicines (% Frequency)
Perceived knowledge		
Very little	60.5	26.0
Modest	36.8	69.2
Thorough	2.7	4.8
Actual knowledge: General topics*		
Very little [†]	9.1	2.8
Modest [‡]	64.8	52.8
Thorough [§]	26.1	44.3
Actual knowledge: Specific topics*		
Very little [†]	66.7	32.1
Modest [‡]	29.2	59.4
Thorough [§]	4.1	8.5
Frequency of usage		
Never	29.7	1.8
Seldom	38.1	37.0
Periodically	27.0	47.9
Continuously	5.1	13.3
Reasons for taking		
Cure illness	12.3	63.5
Treat chronic condition	3.5	11.9
Prevention/well-being	44.7	13.5
None stated	39.6	11.0
Frequency of seeing physician/herbalist		
Never	88.8	2.4
Seldom	8.8	21.6
Once/year	1.5	39.5
More than once/year	0.9	36.5
Before first usage, consult physician/herbalist	38.4	82.7
Before first use, read labels for		
Purpose of use	92.8	89.9
Possible side effects	91.2	88.7
Storage directions	57.5	58.8
Expected use in the next five years		
Less	6.7	19.9
About the same	38.8	75.8
More	54.5	4.3

* Criteria based on percent correct responses attained on knowledge test

[†] 0%-50% [‡] 50%-75% [§] 75%-100%

The students' decision to use conventional medicines was mainly influenced by their physician, whereas the decision to take herbals was influenced by the media. Although 59% of the students replied that consulting a doctor is important before taking a herbal remedy, there was a large percentage of students (41%) who felt this was not necessary. The doctor's lack of knowledge on herbal remedies and the students' preference for making their own decision on taking an unconventional treatment were the common reasons for not consulting their doctor first. Most important features students consider before choosing a medicine or herbal are fewer side effects (65%) and convenience of use (40%).

Table 4 shows the first choice of treatment for various diseases or symptoms under four categories of conditions. The majority of students would turn to conventional medicine as their first choice of treatment, especially for serious acute conditions. While 42.9% of the students preferred herbals for stress-related conditions, there were also a number of students, 20.9%, who would take neither for treating these types of conditions. These results indicate students are selective in their choice of treatment, depending on the nature of the condition.

Table 4 Distribution of Students' First Choices of Treatment for Specific Conditions (n = 318)

Condition	Herbals % Frequency	Conventional % Frequency	Both % Frequency	None % Frequency
Acute illness				
Common cold	30.1	26.5	28.9	14.6
Flu	15.7	42.6	30.2	11.5
Headache	4.8	75.8	9.3	10.1
Serious acute				
Abdominal pain	7.7	72.9	8.0	11.3
Vomiting blood	1.8	77.3	8.0	12.9
Chest pain	1.8	77.3	5.4	15.4
Stress related				
Insomnia	38.6	23.2	18.1	20.2
Low energy	59.3	9.9	12.3	18.6
Anxiety	30.9	31.8	13.2	24.1
Chronic				
Pain	4.8	68.7	19.3	7.2
Arthritis	14.3	52.3	26.1	7.3
Allergies	14.0	54.6	23.9	7.5
Skin rash	16.5	53.5	24.6	5.4

Table 5 presents the attitudinal results grouped as indexes. Cronbach's alphas indicate good internal validity. Strongest agreement existed for CM-A and IH-A. Satisfaction with doctor's care was highly correlated ($r=.358$) with confidence in conventional medicine. The majority of students agreed with all items comprising CM-A and IH-A, however a large number (44.3%) had no opinion about herbals having the same status as conventional medicines. In contrast, for HR-A, the majority of students were neutral regarding confidence in herbals and their ability to relieve health problems. However, the majority agreed that herbals are more convenient for minor ailments, and that they can be used for improving health and treating illness. For PH-A, students responses were more diverse. Eighty-six percent agreed that health of mind, body and spirit are related, while for other items, responses in the positive and neutral categories predominated. We infer that students remain strongly committed to using conventional medicines, but also express interest in holistic health, in taking greater control of their own healthcare and in the benefits herbal remedies can bring.

Table 5 Student Attitudes toward Herbal Remedies, Integrated Healthcare, Personal Health and Conventional Medicines (n=318)

Attitude Group (Cronbach's Coefficient Alpha)	Level of Agreement ^{*,†} (Mean ± SE)	Association with HR-A IH-A PH-A CM-A (Correlation Coefficient) [‡]			
		HR-A	IH-A	PH-A	CM-A
HR-A: Herbal Remedies Attitude Index (Alpha=0.76)	65.3% ± 0.9%	1.000	0.613	0.303	0.080
Great confidence in herbal remedies	3.6 ± 0.1				
Herbal remedies relieve problems	4.0 ± 0.1				
Take herbals to improve health and prevent illness	4.8 ± 0.1				
Herbals can promote health and treat illness	4.6 ± 0.1				
Herbals more convenient for colds, flu or sore throat	4.4 ± 0.1				
IH-A: Integrated Healthcare Attitude Index (Alpha=0.81)	74.1% ± 1.1%	0.613	1.000	0.346	0.066
Herbals should be part of medical school curriculum	4.9 ± 0.1				
Herbal remedies should have same status as conventional medicines in the health care system	4.2 ± 0.1				
Both herbal remedies and conventional medicines can be integrated into health care system	5.0 ± 0.1				
PH-A: Personal Health Attitude Index (Alpha=0.59)	63.6% ± 0.8%	0.303	0.346	1.000	0.014
Prefer to control own health care	4.3 ± 0.1				
Health status is as good as I want it	3.4 ± 0.1				
Health care chosen is compatible with values and beliefs on the nature of health and illness	4.1 ± 0.1				
Health of body, mind and spirit are related	5.4 ± 0.1				
Prefer organically grown food	4.1 ± 0.1				
Read food labels	4.3 ± 0.1				
Processed convenience foods do not fit my lifestyle	3.7 ± 0.1				
CM-A: Conventional Medicines Attitude Index (Alpha=0.73)	75.8% ± 0.9%	0.080	0.066	0.014	1.000
Great confidence in conventional medicine	4.3 ± 0.1				
Pharmaceuticals relieve problems	4.5 ± 0.1				
Take prescription medicine for serious illness	5.5 ± 0.0				
Satisfied with doctor's care	4.6 ± 0.1				
Understand doctor's answers	4.7 ± 0.1				
Conventional medicines are clinically tested for safety and effectiveness	5.1 ± 0.1				

* Index scores range from 0% (strongly disagree with every item) to 100% (strongly agree with every item)

† Item scores range from 1 (strongly disagree) to 6 (strongly agree)

‡ Values shown in **bold** are statistically significant (p<0.001) those not bolded are not significant (p>0.050)

As shown in Table 5, correlations between HR-A, IH-A and PH-A are highly significant, but CM-A is not significantly associated with any of these indexes. This may indicate that positive attitudes to herbal remedies are not a rejection of conventional medicine, but rather related to interests in holistic health and a desire to take control of one's healthcare. Interestingly, agreement that pharmaceuticals can relieve health problems is also significantly correlated with agreement that herbals can relieve health problems, again suggesting that favour for both forms of healthcare products coexists.

Contrasted characteristics of users and non-users of herbal remedies are summarized in Table 6. Users and non-users differed significantly in their attitudes and in their knowledge about specific herbal remedies, but not in their general knowledge about herbal remedies and conventional medicines. Users were significantly older, had longer university attendance and reported a higher incidence of parental use of herbals, but otherwise did not differ significantly from non-users in most demographic and lifestyle characteristics surveyed. Current users were more likely to also take vitamins and minerals, take herbals and conventional medicines together and expect to choose herbals more often in the future. Strikingly, 63.3% of users and 39.1% of non-users expect to increase their use of herbals in the next five years, indicating satisfaction and a growing interest in herbal remedies. As well, a large majority of users and non-users support testing of herbals for safety and effectiveness.

Table 6 Comparison of Current Users and Current Non-users of Herbal Remedies (n=318)

Characteristic (Result)	Current Users of Herbal Remedies (n=180) (Result ± SE)	Current Non-users of Herbal Remedies (n=138) (Result ± SE)	Difference (Test Statistic (z [†] or t [‡]))
Knowledge and attitudes			
Personal Health Attitude index (mean)	65.4% ± 1.2%	61.3% ± 1.1%	t= 2.49
Conventional Medication Attitude Index (mean)	73.7% ± 1.2%	78.7% ± 1.1%	t= 2.94
Integrated Health Attitude Index (mean)	78.0% ± 1.4%	69.0% ± 1.7%	t= 4.07
Herbal Remedies Attitude Index (mean)	69.9% ± 1.1%	59.4% ± 1.4%	t= 5.99
Agree or strongly agree that it's not important to clinically test herbals for safety and effectiveness (%)	8.9% ± 2.1%	15.2% ± 3.1%	z=1.74
General knowledge about herbal remedies (mean)	65.8% ± 1.1%	66.6% ± 1.3%	t=0.48
General knowledge about conventional medicines (mean)	76.0% ± 0.9%	75.7% ± 1.1%	t=0.19
Specific knowledge about herbal remedies (mean)	41.1% ± 1.5%	23.7% ± 1.6%	t= 7.83
Specific knowledge about conventional medicines (mean)	57.5% ± 1.2%	55.8% ± 1.6%	t=0.90
Demographics			
Age (% over 25 years old)	51.7% ± 3.7%	39.1% ± 4.2%	z= 2.22
Gender (% female)	13.9% ± 2.6%	13.0% ± 2.9%	z=0.22
Years in university (% two or more)	70.0% ± 3.4%	52.2% ± 4.3%	z= 3.25
Herbal and conventional medication practices			
Self-described knowledge of herbal remedies (%)§	3.3% ± 1.3%	2.2% ± 1.2%	z=0.62
Take vitamins or minerals (% more than twice per week)	43.3% ± 3.7%	25.4% ± 3.7%	z= 3.32
Use conventional medicines (%)	58.9% ± 3.7%	63.0% ± 4.1%	z=0.75
Would use herbal remedies and conventional medication together (% sometimes or always)	42.8% ± 3.7%	7.2% ± 2.2%	z= 7.04
Parents use conventional medicines (%)	71.7% ± 3.4%	69.6% ± 3.9%	z=0.41

Statistically significant differences are indicated in **bold**.

[†] Normally distributed z-statistic was computed for differences between proportions

[‡] Independent sample pooled variance t-statistic with df=316 was computed for differences between means

§ Thorough knowledge

|| Periodically or continuously

DISCUSSION

The results from our study must be interpreted with caution. The participants were from a convenience sample of a student population that is predominantly female. A limitation to the use of university students for this study is that they are typically in good health, absent of ailments other than minor illnesses such as the cold, flu and headache. On the plus side, university students are an appropriate group for our study as they are prevalent users of non-conventional medicine⁹; of uniform age, income and level of education. The uniformity of student characteristics minimizes the confounding effects from demographic variables so we can focus on the influence of knowledge, attitudes and beliefs on their use of herbal remedies and conventional medicines.

As they are a healthy group of individuals, it is not surprising that greater number of students in our survey placed more reliance on over-the-counter medicines (87%) than prescription drugs (63%) in the past year. This higher reliance on self-medication, indicating students' desire to take greater control of their own health care, is also reflected by their use of herbal remedies. Reported herbal remedy use within the previous year (53%) is comparable to the rate reported for an older population⁴ and for university students¹⁰ but substantially lower than the value reported by others.^{6,11-16} Women are more likely than men to use complementary and alternative medicine,^{4,10,13,14,17,18,19} and our results may be biased due to the study population.

Despite this high usage, and in agreement with other reports,^{3,6,8,20} the majority of the students in our survey did not, or would not, consult their doctors before taking herbal remedies, primarily because they preferred to make their own healthcare decision, and the belief that doctors are not knowledgeable on herbal remedies. Only 2% of the students were concerned about doctor disapproval. The students' unwillingness to consult doctors, together with their low level of knowledge on specific uses of herbal remedies, potentiates health hazards from dangerous side effects and adverse reactions that may lead to serious medical complications, even fatality.^{8, 21-23} There is a need for health practitioners to be able to provide the support for and reliable advice on herbal remedies as well as conventional medicines.

As students mature, and if the present trend in usage continues, there will be a greater demand for these healthcare products as the most prevalent users are those people aged 40 years and older.^{4,11,17,18} The challenge is to provide safe, proven products along with reliable information to meet consumer demand. Health Canada is addressing consumer concerns for greater access and product safety by implementing newly developed Natural Health Product Regulations in January 2004.²⁴

The attitudinal findings from our study illustrate three main concepts. First, students' confidence in either the herbal remedies or conventional medicines is reflected in their interaction with their health practitioners and their utilization and satisfaction with the products. Greater usage of herbal remedies is not necessarily an indication of a more negative attitude towards conventional care. Second, students' philosophical orientation¹⁵ will affect their choice of the products. Those who believe in controlling their own health care decision and who place significance on body, mind and spirit for their well-being, are more compatible with alternative health care. Finally, our findings show the changing needs and values for herbal remedies and conventional medicines. Conventional medicines are for serious illness; herbal remedies are for prevention and promotion of health and well-being. Integrating the two is not simply the combination of conventional medicines and herbal remedies, but a change in focus from treating the disease to a holistic approach for achieving health and well-being.²⁵

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