The Use of Herbal and Other Non-vitamin, Non-mineral Supplements among Pre- and Post-menopausal Women in Ontario

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ABSTRACT

Background: Herbal or other non-vitamin, non-mineral (NVNM) supplements are used by many Canadians, and are of public health significance given potential health effects. The majority of supplement users are women, yet there are limited data on their pattern of use. Ontario women were surveyed about their use of NVNM supplements, including those for women's health, and characteristics associated with use were examined.

Methods: 3,423 randomly selected Ontario households were telephoned to identify eligible women (25-65 years). Of the 1,741 identified, 800 agreed to participate and were mailed a self-administered questionnaire querying NVNM supplement use and health-related characteristics. Prevalence of use, duration, and reasons for use were calculated; distributions of respondent characteristics were tabulated and associations with supplement use were assessed.

Results: 478 women (27%) completed questionnaires; 64% reported ever, and 34% reported current use of NVNM supplements. Echinacea was the most frequently used, followed by evening primrose, garlic, and camomile; supplements were used for less than one year. Alleviation of symptoms and prevention of illness were two primary reasons for taking NVNM supplements. 49% reported ever, and 37% reported current use of supplements for women's health, and for reasons similar to other NVNM supplements. High body mass index (≥ 30.0 kg/m²) was associated with more supplement use, and visiting a physiotherapist in the past year was associated with less.

Conclusion: Findings suggest a high level of NVNM supplement use among Ontario women, possibly associated with certain health-related characteristics. This has important public health implications considering possible benefits and/or interactions with conventional medications.

MeSH terms: Dietary supplements; plants, medicinal; phytoestrogens; nutrition surveys; Canada; women's health

La traduction du résumé se trouve à la fin de l'article.

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Many Canadians use alternative forms of health care,^{1,2} including dietary supplements such as herbal or other non-vitamin, non-mineral (NVNM) health products.²⁻⁵ NVNM supplements are taken to improve well-being, prevent or alleviate symptoms of disease, and are perceived as alternatives to conventional medicine with fewer side-effects.^{3,5,6} Widespread use among Canadians and potential health effects³⁻⁶ are of public health significance, but until recently⁷ only two early prevalence studies were available, and updated data are needed.^{3,4}

The majority of NVNM supplement users are women,^{3,4,7-10} yet there is little information on their pattern of use.^{2,4,6,11} Since women of all ages use NVNM supplements, it is important to understand the extent and type of preparations used, and how these vary with age or other characteristics. Given that many experience premenstrual or menopausal symptoms and may use supplements for relief, NVNM supplements for women's health are of particular interest.^{2,6,12,13} A population-based survey was designed to describe the use of NVNM supplements by Ontario women and to explore socio-demographic and health-related factors associated with use.

METHODS

Study sample and design

Between November 2002 and April 2003, a database of Ontario-wide residential numbers from Info-Canada was used to select a random sample of women, aged 25 to 65 years. After four calls to 3,423 households, 24% could not be contacted, and 26% did not meet inclusion criteria (age, sex, English-speaking). Of 1,741 eligible women, 800 agreed to participate and were mailed questionnaires. Follow-up was done two weeks (postcard) and six weeks (telephone) after the initial mailing to encourage response. Ethics approval was obtained from the Ethics Review Office at the University of Toronto.

Exposure assessment

A 10-page, 22-item self-administered questionnaire was developed to collect information on NVNM supplement use as well as socio-demographic and health-related characteristics. The questionnaire listed 28 generic supplements (primarily herbal) for

general or women's health,^{2,3,6,10-12,14-17} including 13 based on reports of estrogenic activity, presence of phytoestrogens, or use for premenstrual or menopausal symptoms (Table I).^{2,6,12,16,18-23} Additionally, 22 brand-name supplements marketed to women and containing at least 1 of the 13 aforementioned supplements, were listed. Participants were asked to indicate if they ever took or are current users of listed supplements, as well as duration of and reasons for use.

Self-reported data were collected on age, education, income, marital status, ethnicity, urban/rural residence, smoking status, alcohol intake, work and recreational activity, health status, menopausal status, and use of health care professionals in the past year. Self-reported height and weight were used to calculate body mass index (BMI).

Statistical analysis

The frequency distributions of respondent characteristics were tabulated. The prevalence of ever and current NVNM supplement use and, among users, the duration of and reasons for use were reported if ≥ 20 respondents listed ever using the supplement. Multivariate logistic regression was used to calculate odds ratios and their 95% confidence intervals for current use. A variable was considered for the final model if the p-value for the Wald chi-square statistic for its inclusion in an age-adjusted model was less than 0.25. Analyses were performed using SAS Version 8.2.²⁴

RESULTS

Of 1,741 women identified as eligible, 478 (27%) completed questionnaires. Most had post-secondary education and high household income. The majority were married, white, non-smokers, moderately to very active, in good, very good, or excellent health, and visited a family physician or dentist in the last year. About half were post-menopausal or had a BMI of 20.0 to 24.9 kg/m² (Table II).

Of the respondents, 304 (64%) reported ever taking NVNM supplements and 161 (34%) were current users (Table III). Echinacea was the most prevalent supplement ever or currently used, followed by evening primrose, garlic, and camomile. Thirteen generic supplements were used infrequently and are reported as 'other'

TABLE I

Supplements Included in the Questionnaire Used Among Ontario Female Participants*

Generic supplements for general health (n=15)			
aloe*	echinacea*	goldenseal*	St. John's wort*
camomile	garlic*	kava kava	saw palmetto*
cranberry*	ginkgo biloba	lecithin	valerian*
devil's claw*	American ginseng	pycnogenol	
Generic supplements for women's health (n=13)			
bioflavonoid	dong quai	ipriflavone	wild yam
black cohosh*	evening primrose*	isoflavones	
blue cohosh	Asian ginseng	licorice*	
chasteberry	hops*	red clover	
Brand-name supplements for women's health (n=22)			
Cohosh Plus	La Femme	Phyto Soya	Remifemin
Clear PMS	Menopause Formula	Phytoestrogen	Revivall
Estro Logic	Meno-herbs	PMS Herbal	Transcend
Estro Lean	Meno	PMS+	Women's Meno Caps
Estrosense	M.N.P.	Perfect Balance	
Estrotone	Natural HRT	Promensil	

* single ingredient monograph available from Natural Health Products Directorate (Health Canada)⁵⁰

(Table III). Of 15 supplements reported individually, ever use ranged from 6% for American ginseng to 67% for echinacea, and current use from 1% to 41% for the same two items. Most users took supplements for less than one year, although longer use was more frequently reported for camomile, cranberry and lecithin. One third reported taking supplements for one to five years, and use beyond five years was considerably lower for all except camomile and garlic.

Primary reasons for taking NVNM supplements were to alleviate symptoms of or prevent illness, improve quality of life, or reduce menopausal symptoms (Table IV). These were also main reasons for using individual supplements (data not shown). Most aloe, echinacea, and cranberry users reported these to alleviate symptoms of illness. Reduction of menopausal symptoms was the main reason for taking black cohosh, dong quai, wild yam, and evening primrose. The majority of garlic and lecithin users reported taking these to prevent illness. Most Asian-ginseng users reported taking it to improve quality of life; most American-ginseng users, to improve physical performance. Stress reduction was the primary reason for taking camomile, St. John's wort and valerian, and most reported ginkgo biloba for improving mental performance.

Forty-nine percent of supplement users reported ever using 13 generic women's health supplements, and 37% reported using these currently (data not shown). Five supplements (evening primrose, Asian ginseng, black cohosh, wild yam, dong

quai) were used by 7-32% of ever and 3-24% of current users (Table III). Most remaining generic and all brand-name supplements were used by $\leq 2\%$ of users. Reasons for use followed the same order as any NVNM supplements, and most were used for reasons other than reducing menopausal symptoms (Table IV).

After testing all characteristics for multivariate inclusion, only age, BMI, visiting a physiotherapist, and menopausal status were examined together. No association was found between menopausal status and current supplement use and this variable was dropped (Table V). Although age was not significantly associated with current supplement use, there was a suggestion of increased risk of use among the youngest group. The risk of current supplement use tended to increase with BMI, significantly so at the highest BMI (AOR=1.99, 95% CI: 1.10-3.63). The odds of using supplements were significantly less among women who visited a physiotherapist (AOR=0.46, 95% CI: 0.21-0.98).

DISCUSSION

Since sex differences have been reported in NVNM supplement use,^{4,7-9,25-27} it is important to compare our data with those from other studies among women. Most defined use over multiple days, the past week, or past year as 'current', and included supplements identified from recall, varying questionnaire items, or product labels.^{7-9,25-29} Highlighting the variable definition of 'current' use, issues of validity are also raised.³⁰⁻³² Others reported current

TABLE II

Distribution of Socio-demographic and Health-related Characteristics Among Ontario Female Participants (n=478)*

Variable	n (%)	Variable	n (%)
Age (years)		Recreational activity**	
25-35	74 (16)	Non-active	53 (11)
36-45	125 (27)	Lightly active	91 (19)
46-55	159 (34)	Moderately active	181 (38)
56-65	107 (23)	Active	84 (18)
Highest education		Very active	69 (14)
Elementary/high school	108 (23)	Health status	
Post-secondary	364 (77)	Excellent	118 (25)
Household income (before tax)		Very good	190 (40)
Middle or low (<\$50,000)	92 (21)	Good	134 (28)
High (≥\$50,000)	343 (79)	Fair-poor	35 (7)
Marital status		Menopausal status	
Single/never married	29 (6)	Post-menopausal	201 (42)
Widowed/divorced	48 (10)	Pre- or peri-menopausal	273 (58)
Married	396 (84)		
Ethnicity		Health care professionals	
Non-white†	48 (10)	visited in last 12 months††	
White	424 (90)	Dentist	
Rural/urban residence‡		Yes	419 (88)
Rural	38 (8)	No	56 (12)
Urban	440 (92)	Family physician	
Current BMI (kg/m²)§		Yes	429 (90)
Underweight (<20.0)	43 (9)	No	46 (10)
Normal (20.0-24.9)	239 (50)	Specialist physician	
Overweight (25.0-29.9)	138 (29)	Yes	192 (40)
Obese (≥30.0)	58 (12)	No	283 (60)
Smoking status (cigarettes/day)		Pharmacist	
Non-current	411 (87)	Yes	228 (48)
Current	64 (13)	No	247 (52)
Moderate (≤9)	31 (48)	Chiropractor	
Heavy (>9)	33 (52)	Yes	71 (15)
Alcohol intake (drinks/week)		No	404 (85)
Non-current	144 (30)	Nurse	
Current	331 (70)	Yes	43 (9)
Moderate (≤4)	224 (68)	No	432 (91)
Heavy (>4)	106 (32)	Physiotherapist	
Work activity¶		Yes	48 (10)
Sitting	196 (42)	No	427 (90)
Light	175 (37)	Massage therapist	
Moderate or strenuous	100 (21)	Yes	110 (23)
		No	365 (77)

* numbers may not add to totals because of missing values and/or rounding

† categories included Black, Aboriginal, South Asian, Chinese, East Asian other than Chinese, and Other

‡ based on urban/rural postal code designation

§ since few women had BMI <18.5, underweight was categorized using Health Canada's 1988 definition (<20); other categories reflect 2003 guidelines⁵¹

|| one drink identified in questionnaire as 1 bottle/can beer, 1 glass wine, or 1½ oz hard liquor

¶ work activity categories included sitting (e.g., desk job, school), light (e.g., driving, standing jobs), moderate (e.g., lifting, carrying, heavy cleaning), strenuous (e.g., heavy construction, manual labour)

** recreational activity categories were created by combining frequency measures (never, <once/week, 1-2 times/week, 3-5 times/week, >5 times/week) with intensity measures (light, moderate, strenuous); activity measures were developed for this study and were not validated before use

†† other health care professionals (acupuncturist, nutritionist, herbalist, homeopathic, naturopathic, or traditional Chinese doctor) were visited by ≤5% of participants and are not reported

use among North American women ranging from 12-46%.^{7-9,25-29} Two Canadian studies reported lower use than us (16%, 12%),^{4,7} but based on one or two days of recall they are likely underestimates since more days are needed to identify supplement use.³³ The only other Canadian study reported use by women and men: current use in Ontario (37%) was surprisingly similar to our estimate and may be explained by their over-sampling of women and inclusion of herbals and homeopathic remedies.³

Previous studies reported echinacea and/or garlic as frequently used NVNM supplements among women, or women and men combined.^{3-5,7,8,27,34} Echinacea was the most prevalent supplement ever or currently used by women in our study, followed by evening primrose, garlic and camomile. These were similarly ranked in other Canadian studies among women⁴ or Ontario women and men,^{3,7} although the inclusion of ginseng rather than evening primrose in one study³ may reflect the sex-specific use of evening primrose by women

in our study, and the higher use of ginseng by men.^{4,8} Alleviating symptoms of illness, preventing illness, improving quality of life, and reducing menopausal symptoms were main reasons for taking NVNM supplements, and these are consistent with other Canadian findings, although menopausal symptoms were not queried.³ Our data also showed most users took supplements for less than one year, whereas the previous study reported one to five years.³ This may reflect the ability of a non-specific question about herbal supplements to capture a different set of items used for longer duration than those in our questionnaire.

Although associations between NVNM supplement use and characteristics such as age, education, ethnicity, and smoking were not supported by our data, they have been reported,^{7-9,25-29,34} including in the few studies where women were examined separately.^{9,26,28,29} Age was not associated with use in our study of 25-65 year olds, although the odds ratio was highest for the youngest group, which might indicate a cohort effect: greater awareness among younger women of possible benefits of these products. In contrast, others reported greater use with age, particularly after age 45, and often extending beyond age 65.^{7-10,26,34} Associations with BMI are inconsistent,^{4,8,10,25,27} although our finding that women with higher BMI were more likely to use NVNM supplements agrees with results from two other studies.^{10,25} Since no supplements in our questionnaire are recommended for weight loss,³⁵ and weight loss was infrequently reported as a reason for use, obese women may use supplements to alleviate or prevent health risks associated with obesity.³⁶ Our finding of a lower risk of supplement use among those visiting a physiotherapist is unique and may be due to chance, although it suggests that some women may be less likely to engage in multiple modes of alternative care, or that physical manipulation may successfully manage certain conditions and reduce the need for supplements.²⁸

In studies examining women's use of specific NVNM supplements, items for women's health were ranked similarly to those in our study (evening primrose, ginseng, black cohosh, dong quai, wild yam).^{4,8,37} All but ginseng were used primarily for menopausal symptoms by

women in our study. We found no association between menopausal status and supplement use, and no other study examined this across a span of ages. Although increased use after age 45 has been reported,^{7,9,26} it is not clear how this relates to menopause specifically. Our finding that most women, including menopausal women, used supplements for reasons other than menopause is consistent with others^{28,37} and suggests the need to examine use and risk association throughout the life course,^{38,39} and beyond a menopause focus.^{13,40} Our study may be the first to report use of specific women's supplements by those 25 years and older, and others are needed to corroborate our findings.

Several study limitations must be addressed. The response in our study, although similar to one Canadian NVNM study,^{4,41} was lower than another, possibly due to survey methods.³ The last study surveyed all Canadian provinces using a "fixed panel" of paid respondents, while our study was limited to Ontario, a province with high non-response.⁴² Moreover, Canadian response rates have decreased with time,⁴³ so lower response to our later survey is not surprising.

Exclusion of those without telephones through random digit dialling is a concern, as is response bias, since only 27% of eligible women participated. Non-respondents may have less education and belong to ethnic minorities more than respondents.^{44,45} Since these characteristics may be inversely associated with supplement use, and our sample was more educated and less ethnically diverse than the general population,^{46,47} our reported prevalence of use may be overestimated. Although all self-reported data are prone to misclassification, two examples follow. Some participants reported taking garlic or cranberry as food rather than as supplements, leading to overestimates. Future studies might distinguish supplements from similarly-named foods. Additionally, classification of perimenopausal women as pre-menopausal likely limited our ability to examine menopausal status and supplement use; future studies might categorize menopausal status using items that are physiologically informative.

The high level of NVNM supplement use among Ontario women reported here has important public health implications,

TABLE III

Distribution of Ever and Current Use of Specific Supplements Among Ontario Female NVNM Supplement Users*

Supplement	Ever Use (n=304) n (%)	Current Use (n=161) n (%)	Duration of Ever Use (Years)		
			Less than 1 n (%)	1-5 n (%)	More than 5 n (%)
Aloe	45 (15)	11 (7)	26 (68)	8 (21)	4 (11)
Black cohosh†	38 (13)	12 (8)	28 (74)	9 (24)	1 (3)
Camomile	69 (23)	36 (22)	17 (27)	24 (38)	22 (35)
Cranberry	50 (17)	25 (16)	20 (43)	21 (45)	6 (13)
Dong quai‡	22 (7)	5 (3)	11 (55)	8 (40)	2 (5)
Echinacea	202 (67)	66 (41)	104 (55)	62 (33)	24 (13)
Evening primrose†	97 (32)	39 (24)	55 (57)	31 (32)	10 (10)
Garlic	74 (25)	36 (22)	36 (51)	19 (27)	16 (23)
Ginkgo biloba	54 (18)	18 (11)	30 (60)	19 (38)	1 (2)
Ginseng, Asian†	48 (16)	11 (7)	23 (52)	19 (43)	2 (5)
Ginseng, American	20 (6)	2 (1)	13 (68)	4 (21)	1 (5)
Lecithin	28 (9)	15 (9)	13 (47)	10 (36)	5 (18)
St. John's wort	61 (20)	8 (5)	40 (71)	16 (29)	0 (0)
Valerian	27 (9)	6 (4)	16 (70)	6 (26)	1 (4)
Wild yam‡	22 (7)	6 (4)	12 (57)	7 (33)	2 (10)
Other‡	49 (16)	42 (26)	25 (53)	17 (36)	5 (11)

* NVNM (non-vitamin, non-mineral supplements) include only generic items (no brand-name items) in Table I; numbers may not add to totals because of missing values and/or rounding

† generic supplement for women's health (Table I)

‡ includes any generic supplement with <20 ever users each (n): bioflavonoid (5)†, blue cohosh (2)†, chasteberry (4)†, devil's claw (13), goldenseal (18), hops (1)†, ipriflavone (0)†, isoflavones (5)†, kava kava (15), licorice (16)†, pycnogenol (10), red clover (8)†, saw palmetto (4)

TABLE IV

Distribution of Reported Reasons for Using Any NVNM* or Women's Health† Supplements Among Ontario Female NVNM Supplement Users

Reason for Use	Any NVNM* (n=304) n (%)	Any for Women's Health† (n=150) n (%)
Alleviate symptoms of illness	190 (63)	53 (33)
Prevent illness	172 (57)	49 (31)
Improve quality of life	109 (36)	33 (21)
Reduce menopausal symptoms	108 (36)	37 (23)
Reduce stress	90 (30)	23 (14)
Improve mental performance	73 (24)	24 (15)
Improve physical performance	57 (19)	16 (10)
Lose weight	12 (4)	2 (0.1)

* NVNM (non-vitamin, non-mineral supplements) include only generic items in Table I

† supplements include only generic items for women's health (no brand-name items): bioflavonoid, black cohosh, blue cohosh, chasteberry, dong quai, evening primrose, Asian ginseng, hops, ipriflavone, isoflavones, licorice, red clover, and wild yam

TABLE V

Odds Ratio (OR)* Estimates and 95% Confidence Intervals (CI) for Any Current NVNM Supplement Use and Health-related Characteristics Among Ontario Female Participants†

Variable	User (%)	Non-user (%)	OR*	CI (95%)	P-value‡
Age (years)					0.58
25-35	29 (6)	45 (10)	1.45	(0.76-2.74)	
36-45	41 (9)	84 (18)	1.10	(0.60-1.87)	
46-55	51 (11)	108 (23)	1.00	(0.57-1.63)	
56-65	36 (8)	71 (15)	1.00		
Current BMI (kg/m²)§					0.09
Underweight (<20.0)	11 (2)	32 (7)	0.73	(0.34-1.56)	
Normal (20.0-24.9)	75 (16)	164 (34)	1.00		
Overweight (25.0-29.9)	48 (10)	90 (19)	1.23	(0.78-1.94)	
Obese (≥30.0)	27 (6)	31 (7)	1.99	(1.10-3.63)	
Visited physiotherapist					0.04
No	151 (32)	276 (58)	1.00		
Yes	9 (2)	39 (8)	0.46	(0.21-0.98)	

* OR estimates adjusted for age, BMI, visited physiotherapist (in past 12 months)

† NVNM (non-vitamin, non-mineral supplements) include only generic items in Table I; numbers may not add to totals because of missing values and/or rounding

‡ based on likelihood ratio statistic; bold numbers are significant

§ since few women had BMI <18.5, underweight was categorized using Health Canada's 1988 definition (<20); other categories reflect 2003 guidelines.⁵¹

including improvement through possible benefits, and/or deterioration given potential interactions with conventional medications, and that few report use to health practitioners.^{7,48,49} Studies are needed to address intake measurement and validation, and to examine sex-specific use across the life course and health-related associations. Additionally, a uniform definition of items included under the rubric of NVNM supplements may improve risk-benefit evaluations, and help guide their safe and efficacious use.

REFERENCES

- Wiles J, Rosenberg MW. 'Gentle caring experience'. Seeking alternative health care in Canada. *Health & Place* 2001;7:209-24.
- Seidl MM, Stewart DE. Alternative treatments for menopausal symptoms. Systematic review of scientific and lay literature. *Can Fam Phys* 1998;44:1299-308.
- Non-prescription Drug Manufacturers Association of Canada and AC Nielsen. *Health Vision '98*. Ottawa: Non-prescription Drug Manufacturers Association of Canada and AC Nielsen, 1998.
- Troppmann L, Johns T, Gray-Donald K. Natural health product use in Canada. *Can J Public Health* 2002;93:426-30.
- Health Canada. Baseline Natural Health Products Survey Among Consumers. Final Report. Ipsos-Reid Survey. March 2005. Available online at: http://www.hc-sc.gc.ca/dhp-mpp/alt_formats/hpfb-dgpsa/pdf/pubs/eng_cons_survey_e.pdf (Accessed October 19, 2006).
- Seidl MM, Stewart DE. Alternative treatments for menopausal symptoms. Qualitative study of women's experiences. *Can Fam Phys* 1998;44:1271-76.
- Singh SR, Levine MAH. Natural health product use in Canada: Analysis of the National Population Health Survey. *Can J Clin Pharmacol* 2006;13:240-50.
- Gunther S, Patterson RE, Kristal AR, Stratton KL, White E. Demographic and health-related correlates of herbal and specialty supplement use. *J Am Diet Assoc* 2004;104:27-34.
- Schaffer DM, Gordon NP, Jensen CD, Avins AL. Nonvitamin, nonmineral supplement use over a 12-month period by adult members of a large health maintenance organization. *J Am Diet Assoc* 2003;103:1500-5.
- Radimer KL, Subar AF, Thompson FE. Nonvitamin, nonmineral dietary supplements: Issues and findings from NHANES III. *J Am Diet Assoc* 2000;100:447-54.
- UIC. News Tips: NIH awards UIC \$7.9 million to study dietary supplements effectiveness. Available online at: http://www.uic.edu/depts/paff/opa/releases/1999/dietsupp_release (Accessed December 4, 2001).
- Douglas S. Premenstrual syndrome: Evidence-based treatment in family practice. *Can Fam Phys* 2002;48:1789-97.
- Wylie-Rosett J. Menopause, micronutrients, and hormone therapy. *Am J Clin Nutr* 2005;81:1223S-31S.
- Strategic Policy Choices and Canadian Health Food Association. *Canadian Health Food Industry Sector Analysis*. Ottawa: Strategic Policy Choices and Canadian Health Food Association, 1997.
- Go VL, Wong DA, Resnick MS, Heber D. Evaluation of botanicals and dietary supplement therapy in cancer patients. *J Nutr* 2001;131:179S-80S.
- Liu J, Burdette J, Xu H, Gu C, van Breeman R, Bhat K. Evaluation of estrogenic activity of plant extracts for the potential treatment of menopausal symptoms. *J Agric Food Chem* 2001;49:2472-79.
- Mar C, Bent S. An evidence-based review of the 10 most commonly used herbs. *Western J Med* 1999;171:168-71.
- Chan RYK, Chen W, Dong A, Guo D, Wong M. Estrogen-like activity of Ginsenoside Rg1 derived from Panax notoginseng. *J Clin Endocrinol Metab* 2002;87:3691-95.
- Coldham NG, Sauer MJ. Identification, quantitation and biological activity of phytoestrogens in a dietary supplement for breast enhancement. *Food Chem Toxicol* 2001;39:1211-24.
- Glazier MG, Bowman MA. A review of the evidence for the use of phytoestrogens as a replacement for traditional estrogen replacement therapy. *Arch Intern Med* 2001;161:1161-72.
- Schellenberg R. Treatment for the premenstrual syndrome with agnus castus fruit extract: Prospective, randomised, placebo controlled study. *BMJ* 2001;322:134-37.
- Setchell KDR, Brown NM, Desai P, Zimmer-Nechemias L, Wolfe BE, Brashear WT. Bioavailability of nutrients and other bioactive components from dietary supplements. *J Nutr* 2001;131:1362S-75S.
- Zava DT, Dollbaum CM, Blen M. Estrogen and progestin bioactivity of foods, herbs, and spices. *Exp Biol Med* (Maywood) 1998;217:369-78.
- SAS Institute Inc., Cary, NC: SAS Institute Inc., 1999-2001.
- Archer SL, Stamler J, Moag-Stahlberg A, Van Horn L, Garside D, Chan Q, et al. Association of dietary supplement use with specific micronutrient intakes among middle-aged American men and women: The INTERMAP study. *J Am Diet Assoc* 2005;105:1106-14.
- Kaufman DW, Kelly JP, Rosenberg L, Anderson TE, Mitchell AA. Recent patterns of medication use in the ambulatory adult population of the United States: The Slone Survey. *JAMA* 2002;287:337-44.
- Ness J, Cirillo DJ, Weir DR, Nisly NL, Wallace RB. Use of complementary medicine in older Americans: Results from the health and retirement study. *Gerontologist* 2005;45:516-24.
- Newton KM, Buist DSM, Keenan NL, Anderson LA, LaCroix AZ. Use of alternative therapies for menopause symptoms: Results of a population-based survey. *Obstet Gynecol* 2002;100:18-25.
- Bair YA, Gold EB, Greendale GA, Sternfeld B, Adler SR, Azari R, et al. Ethnic differences in use of complementary and alternative medicine at midlife: Longitudinal results from SWAN participants. *Am J Public Health* 2002;92:1832-40.
- Raiten DJ, Picciano F, Coates PM. Dietary supplement use in women: Current status and future directions: Introduction and conference summary. *J Nutr* 2003;133:1957S-60S.
- Messerer M, Wolk A. Sensitivity and specificity of self-reported use of dietary supplements. *Eur J Clin Nutr* 2004;58:1669-71.
- Dwyer J, Picciano MF, Raiten DJ and Members of the Steering Committee. Future directions for what we eat in America-NHANES: The integrated CSFII-NHANES. *J Nutr* 2003;133:590S-600S.
- Messerer M, Johansson SE, Wolk A. The validity of questionnaire-based micronutrient intake estimates is increased by including dietary supplement use in Swedish men. *J Nutr* 2004;134:1800-5.
- Millen AE, Dodd KW, Subar AF. Use of vitamin, mineral, nonvitamin, and nonmineral supplements in the United States: The 1987, 1992, and 2000 National Health Interview Survey results. *J Am Diet Assoc* 2004;104:942-50.
- Pittler MH, Ernst E. Complementary therapies for reducing body weight: A systematic review. *Int J Obes* 2005;29:1030-38.
- Goggs R, Vaughan-Thomas A, Clegg PD, Carter SD, Innes JF, Mobasheri A. Nutraceutical therapies for degenerative joint disease: A critical review. *Crit Rev Food Sci Nutr* 2005;45:145-64.

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RÉSUMÉ

Contexte : De nombreux Canadiens prennent des plantes médicinales et autres compléments non-vitaminiques non-minéraux (CNVNM). Le phénomène est d'importance pour la santé publique en raison des effets possibles de ces suppléments sur la santé. La majorité des consommateurs de suppléments sont des femmes, mais on manque de données sur leurs habitudes de consommation. Nous avons sondé les Ontariennes sur leur consommation de CNVNM, y compris les produits de santé des femmes, et analysé les caractéristiques associées à la prise de ces suppléments.

Méthode : Nous avons téléphoné à 3 423 ménages ontariens sélectionnés au hasard pour repérer des femmes admissibles (de 25 à 65 ans). Sur les 1 741 femmes répertoriées, 800 ont accepté de participer au sondage; nous leur avons posté un questionnaire à remplir soi-même, comportant des questions sur leur consommation de CNVNM et leur état de santé. Nous avons calculé la prévalence, la durée et les raisons de la prise de CNVNM, réparti les répondantes selon leur profil de santé et évalué les associations de ces variables avec la prise de suppléments.

Résultats : Des questionnaires ont été remplis par 478 femmes (27 %); 64 % ont déclaré avoir déjà pris des CNVNM, et 34 % ont dit le faire actuellement. Le supplément le plus populaire était l'échinacée, suivi de l'œnothère, de l'ail et de la camomille, et les suppléments étaient pris sur une période inférieure à un an. Les répondantes prenaient principalement des CNVNM pour soulager des symptômes et pour prévenir des maladies. Quarante-neuf p. cent (49 %) des répondantes ont dit avoir déjà pris des produits de santé des femmes, et 37 % ont dit le faire actuellement. Les raisons invoquées étaient les mêmes que pour les autres CNVNM. Un indice de masse corporelle élevé (≥ 30 kg/m²) était associé à une forte consommation de suppléments, tandis que la consultation d'un physiothérapeute au cours de l'année antérieure était associée à une consommation plus faible.

Conclusion : Les Ontariennes font une consommation élevée de CNVNM, et ces niveaux de consommation pourraient être associés à certaines caractéristiques de santé. Ceci pourrait avoir d'importantes répercussions de santé publique étant donné les avantages possibles de ces produits et/ou leurs interactions éventuelles avec les médicaments classiques.

37. Keenan NL, Mark S, Fugh-Berman A, Browne D, Kaczmarczyk J, Hunter C. Severity of menopausal symptoms and use of both conventional and complementary/alternative therapies. *Menopause* 2003;10:507-15.
38. Neuhouwer ML. Dietary supplement use by American women: Challenges in assessing patterns of use, motives and costs. *J Nutr* 2003;133:1992S-96S.
39. Beal MW. Women's use of complementary and alternative therapies in reproductive health care. *J Nurse-Midwifery* 1998;43:224-34.
40. Kurzer MS. Phytoestrogen supplement use by women. *J Nutr* 2003;133:1983S-86S.
41. Palaniappan U, Starkey LJ, O'Loughlin J, Gray-Donald K. Fruit and vegetable consumption is lower and saturated fat intake is higher among Canadians reporting smoking. *J Nutr* 2001;131:1952-58.
42. Beland Y. Canadian Community Health Survey: Methodological overview. *Health Reports* 2002;13:9-14.
43. Allen M. Telephone Refusal Rates Continue to Rise. Available online at: <http://www.pmrs-aprm.com/SpecialResponse/article02.html> (Accessed March 15, 2006).
44. Kjoller M, Thoning H. Characteristics of non-response in the Danish Health Interview Surveys, 1987-1994. *Eur J Public Health* 2005;15:528-35.
45. Moorman PG, Newman B, Millikan RC, Tse CKJ, Sandler DP. Participation rates in a case-control study: The impact of age, race, and race of interviewer. *Ann Epidemiol* 1999;9:188-95.
46. Statistics Canada. 2001 Census: Analysis series. Canada's Ethnocultural Portrait: The Changing Mosaic. 2003. Available online at: <http://www.fin.gov.on.ca/english/demographics/cenhi6.html> (Accessed October 29, 2006).
47. Statistics Canada. Census of Population, Population 15 Years and Over by Highest Degree, Certificate or Diploma (1986-2001 Censuses). Available online at: www.statcan.ca/english/Pgdb/educ42.htm. (Accessed October 29, 2006).
48. Laeque H, Charrois TL, Vohra S. Adverse effects and drug interactions relating to use of St. John's wort. *Can Pharm J* 2006;139:30-33.
49. Dergal JM, Gold JL, Laxer DA, Lee MSW, Binns MA, Lancot KL, et al. Potential interactions between herbal medicines and conventional drug therapies used by older adults attending a memory clinic. *Drugs Aging* 2002;19:879-86.
50. Health Canada. Drugs and Health Products. Single Ingredient Monographs. Available online at: http://hc-sc.gc.ca/dhp-mpps/prodnatur/applications/licen-prod/monograph/mono_list_e.html (Accessed October 19, 2006).
51. Health Canada. *Canadian Guidelines for Body Weight Classification in Adults*. Ottawa: Health Canada, 2003.

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PREVENT, PREPARE for and PROTECT YOURSELF from the next FLU PANDEMIC

The Canadian Public Health Association (CPHA) and the Pandemic Health Alert Network are informing Canadians about the basic public health steps we can all take to help prevent the spread of infection, prepare to cope in an emergency, and protect our health during a flu pandemic.

Around the world, governments are gearing up for the next flu pandemic. Websites, fact sheets and checklists abound. However, the language they use and level of information they provide can be overwhelming and technical. To address this, CPHA and the Pandemic Health Alert Network have created a toolkit of practical, evidence-based information that is communicated in plain language.

This simple and practical toolkit provides Canadians with the information they need to protect themselves in a flu pandemic. The tools are easy to use, with common sense measures Canadians can put into practice in their daily lives.

These simple public health steps fall into three action areas:

1. **PREVENT** – basic public health habits that reduce the chance of catching and spreading the flu, such as proper hand washing;
2. **PREPARE** – easy-to-follow instructions on how to be prepared for a flu pandemic, or other emergency situation; and
3. **PROTECT** – crucial information on self-care during a flu pandemic.

The toolkit is designed to stimulate Canadians' interest to learn more and put that knowledge into action with simple measures that could stem the force of the next flu pandemic. The hope is that these steps will strengthen public resilience. That way we'll all be better prepared to cope in a flu pandemic, or other public health emergency.

The toolkit is available in English and French, online at www.pandemic.cpha.ca.