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Patients' perceptions and use of natural health products

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In my practice, I have noticed that many patients take a variety of natural health products, sometimes with no clear understanding as to why. The goal of this study was to better understand what natural health products patients take and why.

Dans ma pratique, j'ai remarqué que de nombreux patients prennent divers produits de santé naturels, parfois sans bien comprendre pourquoi. L'objectif de la présente étude est de mieux comprendre les produits de santé naturels que prennent les patients et les raisons pour lesquelles ils les prennent.

ABSTRACT

Background: Despite a lack of good scientific evidence for their benefit, Canadians take a lot of natural health products (NHPs). The objectives of this study were to determine patients' perception of the efficacy, safety and quality of NHPs and to characterize NHP use.

Methods: A standardized, 18-question survey was distributed to the general public through a variety of methods.

Results: A total of 326 individuals completed the survey. Eighty-five percent of respondents take 1 or more NHPs. Forty-seven percent agreed/strongly agreed that NHPs are safer than prescription medications and 24% disagreed/strongly disagreed that prescription medications are more effective than NHPs. Three-quarters of respondents agreed/strongly agreed that health care providers should recommend NHPs more often, as most stated they preferred to take an NHP for both a minor ailment (82%) and chronic medical condition (60%). Respondents used 124 different NHPs, most commonly vitamin D, vitamin B and magnesium. Respondents purchased NHPs primarily from health/vitamin stores (66%) and accessed the Internet for information about them (64%). Younger, female respondents were more likely to take NHPs.

Discussion: Patients appear to be comfortable foregoing education from health care professionals about the benefits and risks of NHPs. Patients' comfort with self-prescribing NHPs seems to stem from a perception of general efficacy and quality with little to no concern about harm and appears to be strongly influenced by lay sources of information.

Conclusion: Most respondents take 1 or more NHPs, preferring to use NHPs over prescription medications for minor and chronic health concerns seemingly based on a perception of safety and quality. *Can Pharm J (Ott)* 2018;151:254-262.

Background

The Canadian public takes a lot of natural health products (NHPs), which may include (but are not limited to) vitamins, minerals, herbal remedies, homeopathic remedies, traditional Chinese medicines or other supplements. A 2010 Ipsos-Reid survey, conducted on behalf of Health Canada, demonstrated that 73% of Canadians regularly take an NHP.[1] From 2005 to 2011, the use of dietary supplements among older adults in the United States increased from 52% to 64%.[2] However, scientific evidence to support the efficacy and safety of most of these supplements is generally lacking. Despite this paucity of evidence, many patients take NHPs, presumably based on the assumption that they are effective and/or safe or lay advice from the Internet, television programs, celebrity endorsements or friends/family without consultation with a regulated health care professional.

An abundance of NHPs are available at many community pharmacies despite little to no scientific evidence supporting any health benefit. This imparts inappropriate legitimacy to these products, as some patients may presume NHPs are as safe and/or effective as over-the-counter medications.

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Health Canada has recently proposed new risk-based regulation for self-care products, which includes NHPs, to ensure the level of oversight corresponds to the level of risk of the product.[3] An editorial recently published in the *Canadian Medical Association Journal* called for NHPs to be sold separately from over-the-counter medications to avoid the presumption that NHPs are legitimate therapies,[4] and an opinion published in *The Globe & Mail* by members of the Faculty of Pharmacy and Pharmaceutical Sciences at the University of Alberta questioned whether NHPs should even be sold in pharmacies.[5] Many health care professionals have a limited understanding of NHPs, and circumstances where one recommends an NHP to a patient despite a clear lack of evidence could be interpreted as negligent or substandard care, even in the absence of harm.[6] A recent survey of pharmacists in Alberta indicated that over two-thirds of those polled recommend NHPs "sometimes" or "very often."[7]

Although many patients take NHPs, there are little published data regarding patients' reasons for taking them and which are most commonly used. This information is vital for health care professionals to engage patients in better understanding their beliefs and expectations regarding NHPs. Thus, the objectives of this study were to determine patients' perceptions of the efficacy, safety and quality of NHPs; identify which NHPs are most frequently used by patients; and identify characteristics associated with the use of NHPs.

Methods

Study design

This study used a standardized, anonymous, 18-question survey (Appendix 1, available in the online version of the journal). The survey was created solely for the purpose of this study. It was reviewed for clarity and content prior to dissemination by 7 health care professionals (6 pharmacists, 1 nurse) and 2 lay individuals. All patients received information about the study prior to commencement. Consent was implied for anyone who completed the survey. The survey was administered via 2 methods: paper based or online. The online version was hosted by the University of British Columbia's online survey tool (administered by FluidSurveys). Participants were not provided with any incentives for participation. Research ethics boards at both Fraser Health and the University of British Columbia approved this study via a harmonized review.

KNOWLEDGE INTO PRACTICE

- There is a high use of natural health products (NHPs) among Canadians despite little to no scientific evidence supporting health benefits.
- This study identified that most respondents take 1 or more NHP (85%), preferring to use NHPs over prescription medications for minor ailments (82%) and chronic health conditions (60%).
- Most respondents seem to self-prescribe NHPs based on a perception of safety and quality.
- Younger age and female sex were independent predictors of NHP use.

MISE EN PRATIQUE DES CONNAISSANCES

- Les Canadiens consomment beaucoup de produits de santé naturels (PSN) même si très peu de preuves scientifiques en corroborent les avantages pour la santé.
- La présente étude révèle que la majorité des personnes interrogées prennent un ou plusieurs PSN (85 %), préférant les PSN aux médicaments sur ordonnance pour traiter les affections bénignes (82 %) et les maladies chroniques (60 %).
- La plupart des répondants semblent s'autoprescrire des PSN, car ils les perçoivent comme étant sûrs et de qualité.
- L'âge et le sexe sont des facteurs de prédiction indépendants de l'utilisation des PSN, les jeunes et les femmes étant associés à leur usage.

Survey participants were recruited through a variety of methods. The paper-based version was provided to patients at the Primary Care Clinic at the Chilliwack General Hospital in Chilliwack, British Columbia. This clinic provides care to patients from the Chilliwack area who do not have a family physician and ongoing longitudinal care for complex or unattached patients. The primary investigator provides part-time clinical pharmacy services at the clinic. The study invitation and online survey link was also emailed to patients of the Primary Care Clinic who had previously provided permission to be on an electronic mailing list. Furthermore, the study invitation and online survey link was provided to patients by 2 medication management pharmacists in Burnaby and Surrey, British Columbia, who provide home-based clinical pharmacy services to patients at high risk of adverse drug events.[8] Finally, the survey was included in a newsletter distributed by the Chilliwack Healthier Community, a partnership of local organizations concerned with addressing

TABLE 1 Respondent demographics

	n	%
Age (N = 267)		
<20 years	1	0.4
20-39 years	84	31.5
40-59 years	112	41.9
60-79 years	67	25.1
>80 years	3	1.1
Sex (N = 267)		
Female	213	79.8
Highest level of education (N = 266)		
Up to high school	50	18.8
Trade school	18	6.8
University or college	198	74.4
Marital status (N = 266)		
Single	43	16.2
Married/common law	182	68.4
Separated/widow	41	15.4
Ethnicity (N = 266)		
White	234	88.0
South Asian	6	2.3
First Nations	3	1.1
Latin American	3	1.1
Other	20	7.5

social issues in the region. The survey was included in 2 issues over a 4-week period in March 2017. The Chilliwack Healthier Community also posted the survey information on its Facebook page. The survey was subsequently featured in an unsolicited article (print and online) in the *Chilliwack Progress*, a local newspaper, in June 2017. The survey was open from July 2016 through June 2017.

Study population

The survey was open to all adult (age ≥19 years) members of the public. Persons with cognitive impairment or who could not read English were advised not to participate in the survey. A sample size calculation was not performed, as this study did not involve any direct comparisons between independent groups.

Statistical analysis

Descriptive statistics were used to report the survey responses. A dichotomous univariate analysis was performed using a χ^2 test to identify determinants of use of NHPs based on the collected demographic information. All statistical tests were performed with IBM SPSS Statistics (version 21; SPSS, Inc., an IBM Company, Chicago, Illinois). A p-value of <0.05 was considered statistically significant.

Results

In total, 326 individuals completed the survey; 263 completed the survey in full and 63 partially completed the survey. Of the participants, 309 completed the online survey and 17 completed the paper-based version. A summary of respondent demographics is included in Table 1.

TABLE 2 Survey responses

Question	N	Strongly agree, n (%)	Agree, n (%)	Neither agree nor disagree, n (%)	Disagree, n (%)	Strongly disagree, n (%)
Natural health products are safer than prescription medications	277	68 (24.5)	63 (22.7)	95 (34.3)	36 (13.0)	15 (5.4)
Prescription medications are more effective than natural health products	276	23 (8.3)	64 (23.2)	122 (44.2)	45 (16.3)	22 (8.0)
In general, natural health products are of good quality	273	10 (3.7)	117 (42.9)	93 (34.1)	44 (16.1)	9 (3.3)
Natural health products generally do not have side effects	274	12 (4.4)	65 (23.7)	62 (22.6)	107 (39.1)	28 (10.2)
Doctors, nurses and pharmacists should recommend natural health products more often	273	98 (35.9)	107 (39.2)	38 (13.9)	16 (5.9)	14 (5.1)
For a chronic medical condition (e.g., high blood pressure, diabetes, high cholesterol), I would prefer to take a natural health product rather than a prescription medication	274	82 (29.9)	81 (29.6)	48 (17.5)	47 (17.2)	16 (5.8)
For a minor ailment (e.g., cough due to a cold, indigestion, aches and pains), I would prefer to take a natural health product rather than a prescription medication	274	119 (43.4)	105 (38.3)	27 (9.9)	12 (4.4)	11 (4.0)

Responses to the survey questions are included in Table 2. Eighty-five percent of respondents (233/274) indicated they use 1 or more NHPs. Forty-seven percent of respondents (131/277) agreed or strongly agreed that NHPs are safer than prescription medications. When asked why they consider NHPs to be safer than prescription medications, the most common response was that NHPs are less likely or do not cause adverse effects (52/131, 40%). Other responses included that NHPs are less likely to cause addiction, are "natural" and contain fewer chemicals than prescription medications, are more likely to cure a disease rather than treat the symptoms and have a long history of treating illness. Others cited concerns derived from television commercials or the pharmaceutical industry. Select quotes regarding the safety of NHPs compared to prescription medications are included in Box 1. Twenty-four percent of respondents (67/276) disagreed or strongly disagreed that prescription medications are more effective than NHPs. When asked why they thought NHPs were more effective than prescription medications, most respondents indicated it depended on the situation, citing that NHPs are more effective for minor ailments based on personal experience. Others stated that NHPs are more effective because they are "natural," while some reiterated they believe NHPs treat the underlying cause of the disease rather than the symptoms. Select quotes regarding the efficacy of prescription medications compared to NHPs are included in Box 1. Seventy-five percent of respondents (205/273) agreed or strongly agreed that health care providers should recommend NHPs more often. Most respondents agreed or strongly agreed that they preferred to take an

BOX 1 Select responses regarding the safety and efficacy of natural health products (NHPs)

Why do you think NHPs are safer than prescription medications?

- "Adverse effects can still occur with natural health products. However, when used appropriately and under supervision, less likely."
- "You don't have to watch the latest ad on TV, regarding side effects of meds for a variety of ailments, unless you are ignorant, stupid, brain dead or misinformed."
- "No one in Canada has ever died from or become addicted to natural health products."
- "Fewer side effects, can cure conditions rather than mask symptoms, which can happen with medications that don't heal a condition."
- "Isn't it obvious that things derived from nature are much safer than things concocted in a lab?"

Why do you think NHPs are more effective than prescription medications?

- "I believe some products may be more effective depending on the person, the condition and the product."
- "I believe there is a place for both, depending on the ailment. There are some disease states where prescription medication would be a better choice, yet there are other health issues where NHPs have benefits."
- "Prescriptions are good to relieve pain and other symptoms but don't address the root cause."
- "Because I've personally seen them work better than prescriptions."
- "There is a time and place for prescriptions. But lots of common ailments can be tended to with natural remedies."

NHP for a minor ailment (224/274, 82%) as well as a chronic medical condition (163/274, 60%).

A list of NHPs used by respondents is included in Table 3. Participants stated they used 95 other NHPs in addition to the 29 listed as part of the survey. Only 32% (75/233) and 20% (46/233) stated they take a vitamin/mineral or natural remedy/supplement, respectively, that was recommended by a health care professional (medical doctor, pharmacist, nurse or naturopathic doctor). Sixty-six percent of respondents (156/238) indicated they purchase NHPs from health or vitamin stores, 38% (91/238) from community pharmacies, 32% (76/238) from large-format stores and 29% (70/238) from grocery stores. Twenty-one percent of respondents (49/238) purchase NHPs from the Internet and 17% (41/238) from other sources. The Internet was the most common source of information about NHPs at 64% (152/238), followed by friends/family at 47% (112/238), books/magazines/newspapers at 44% (105/238) and naturopathic doctors at 41% (98/238). Only 25% of respondents get information about NHPs from their pharmacist (60/238) or family physician (59/238). Forty-three percent of respondents (103/239) indicated they spend less than $25 per month on NHPs, while 34% (81/239) indicated they spend $50 or more per month.

A univariate analysis of the predictors of NHP use is included in Table 4. Younger (aged ≤39 years) and female respondents were more likely to take NHPs. Variables that were not statistically significant in the analysis were education, marital status and ethnicity.

Discussion

Most respondents to this survey indicated they take 1 or more NHPs (85%), which is higher but comparable to the 2010 Health Canada survey (73%). Most of these NHPs are likely self-prescribed, as less than one-third stated they were recommended an NHP by a health care professional (including naturopathic doctors). There was an extensive variety of NHPs used by respondents—124 in total—although most were used by less than 10% of participants. Most respondents indicated they would rather take an NHP over a prescription medication for both minor and chronic medical conditions, which appears to be primarily based on a perception of safety and quality.

Approximately half of respondents indicated they believe NHPs are safer than prescription medications. However, only about one-quarter agreed or strongly agreed that NHPs do not have side effects. Therefore, it can be inferred that the other one-quarter of respondents believe NHPs simply have fewer adverse effects than prescription medications. Contrary to these findings, there is evidence in the medical literature of serious harm associated with NHPs, including cases of hepatotoxicity or heavy metal poisoning.[9,10] Furthermore, a 2015 study funded by the US Food and Drug Administration and Centers for

TABLE 3 List of natural health products used by respondents (*N* = 233)

Natural Health Product	*n*	%
Vitamin D	150	64.4
Vitamin B	129	55.4
Magnesium	116	49.8
Vitamin C	110	47.2
Omega-3 fatty acids	107	45.9
Probiotics	101	43.3
Calcium	86	36.9
Multivitamin	80	34.3
Garlic	56	24.0
Melatonin	54	23.2
Echinacea	50	21.5
Iron	50	21.5
Zinc	42	18.0
Vitamin E	34	14.6
Coenzyme Q10	26	11.2
Glucosamine and/or chondroitin	26	11.2
Chromium	17	7.3
Vitamin A	17	7.3
Selenium	16	6.9
North American ginseng (Cold-fX)	14	6.0
Methylsulfonylmethane (MSM)	12	5.2
Valerian	11	4.7
L-carnitine	10	4.3
St. John's wort	10	4.3
Grapeseed extract	7	3.0
Lecithin	6	2.6
Saw palmetto	6	2.6
Ginkgo biloba	5	2.1
Red yeast rice	2	0.9

Disease Control and Prevention concluded that dietary supplements were responsible for over 20,000 emergency department visits in the United States each year.[11] As well, a recent retrospective review showed there was an almost 50% increase in dietary supplement exposures reported to the US National Poison Data System from 2005 to 2012.[12] There is also a risk of interactions between NHPs and prescription medications.[13-15] A recent study found that patients who take both prescription medications and NHPs, compared to those who only take prescription medications, were over 6 times more likely to experience an adverse event.[16] Consequently, a tool to identify NHP-drug interactions was developed to aid clinicians in assessing patients' risk and published in *CPJ*.[15] Some respondents cited concern over television advertisements that communicate the

TABLE 4 Univariate analysis of use of natural health products

Variable	Odds ratio	95% confidence interval	*p*-value
Age <40 vs ≥40 years	2.82	1.22-6.52	0.004
Female vs male	1.33	1.04-1.70	0.003
Postsecondary vs up to high school education	1.11	0.91-1.35	0.24
Married vs single/separated/widowed	1.08	0.84-1.39	0.53
White vs other ethnicity	0.92	0.84-1.00	0.15

potential adverse effects of prescription drugs. However, there was no recognition that NHPs are not required to disclose potential adverse effects of therapy. Somewhat ambiguously, a few respondents stated that their rationale for why NHPs are safer than prescription medications was because of the commercial interests of the pharmaceutical industry. However, there was no expressed awareness of the aggressive retail nature of the NHP industry.

Approximately half of respondents agreed that NHPs were generally of good quality. In actuality, the purity of NHPs is highly questionable. Some products are licensed by Health Canada through the assignment of a Natural Product Number, which indicates that the quality of the product has been assessed; however, this is a relative minority of products available to consumers, which can be imported from other countries or sold over the Internet. A 2015 investigation by the New York State Attorney General's office of 4 major retailers in the United States identified that roughly 4 out of 5 of the NHPs tested contained none of the ingredients listed on the label.[17] Instead, many products contained rice, vegetables and/or household plants.

Respondents expressed less conviction regarding the efficacy of NHPs, as approximately half of respondents were neutral regarding whether prescription medications were more effective than NHPs. The approximately one-quarter of respondents who disagreed or strongly disagreed that prescription medications are more effective than NHPs seemed to base this on personal experience. These respondents were less definite regarding their rationale compared to the statement about the safety of NHPs, as most said it depended on the condition. Others essentially deferred the question by simply reiterating why they believed NHPs were safer than prescription medications.

The results of this study are similar to a survey of 1044 Italian women published in 2006 that showed 73% of respondents stated they took NHPs without consulting a health care provider and 58% were convinced that NHPs are safer than prescription medications.[18] However, the NHPs used in that study (e.g., propolis, aloe, valerian root, blueberry) were noticeably different from those in the present study (e.g., vitamin B, vitamin C, vitamin D, magnesium).

There appears to be a wide disconnect between health care professionals and NHPs. Patients have ready access to NHPs and information about NHPs, which can preclude the involvement of a health care provider. However, there was an apparent divide between patients' expectations of health care providers and their professional responsibility—patients expressed a preference that health care providers recommend more NHPs without apparent acknowledgment of the lack of evidence for most NHPs and the associated ethical responsibility of health care professionals to provide evidence-based recommendations. As the use of NHPs was primarily due to self-prescribing, respondents appear to be comfortable foregoing education about NHPs from a regulated health care professional. For example, respondents stated they commonly purchase NHPs from pharmacies but generally do not seek advice from pharmacists. A study involving focus groups of pharmacists and consumers demonstrated that both groups agreed pharmacists could play an important role in providing education about NHPs, particularly regarding NHP-drug interactions, but that pharmacists required more education to fulfill this role.[19] Patients' comfort with self-prescribing NHPs seems to stem from a perception of general efficacy and quality, with little to no concern about harm, and appears to be strongly influenced by lay sources of information, such as the Internet or

friends and family. There was no apparent concession among respondents of the importance of a balanced discussion of both the potential benefits and potential adverse effects of NHPs. Even more concerning is that many patients may not disclose information about their use of NHPs to their health care provider(s).[20,21] Taking multiple supplements contributes to polypharmacy, which can result in a patient either missing a regularly scheduled medication because of a confusing regimen or consciously stopping a medication in favour of an NHP. Additionally, most NHPs are relatively expensive and over one-third of respondents stated they spend more than $50 per month on them. This could be detrimental to vulnerable populations (e.g., low- or fixed-income individuals) by impairing their ability to afford other essential services.

This study has several limitations that warrant discussion. The response rate represents a small portion of the overall population. Furthermore, the sample is not necessary reflective of the general population due to a possible responder bias, as patients who take and/or are proponents of NHPs may have been more inclined to complete the survey; however, these individuals may be at highest risk of adverse effects or benefit most from consultation with a regulated health care professional. There is also a possibility that individuals who are retailers of NHPs may have completed the survey to provide responses that favour NHPs out of self-interest. As well, there was little variance in the demographics of respondents—most were white females with a university or college education. The survey represents a basic evaluation of patients' perceptions of NHPs, as it used general statements and a standardized Likert scale for most questions. Thus, the nuance as to why respondents held certain beliefs was not assessed. Finally, the survey was created for the sole purpose of this project and has not been validated through additional research. However, this study does provide valuable insight into an area where little to no research exists.

Conclusion

This survey identified that 85% of respondents take 1 or more NHPs. Approximately half of respondents agreed or strongly agreed that NHPs were safer than prescription medications and of good quality. Most respondents expressed a preference to take a NHP for a minor ailment or chronic condition and three-quarters believed health care professionals should recommend NHPs more often. Respondents identified they used 124 different NHPs, the most common being vitamins B, C and D; magnesium; and omega-3 fatty acids. Most individuals purchase NHPs from health food or vitamin stores, and the Internet was the most common source of information about NHPs. Independent predictors of NHP use were younger age (≤39 years) and female sex. ■

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