Research article

Practice patterns of naturopathic physicians: results from a random survey of licensed practitioners in two US States

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Abstract

Background: Despite the growing use of complementary and alternative medicine (CAM) by consumers in the U.S., little is known about the practice of CAM providers. The objective of this study was to describe and compare the practice patterns of naturopathic physicians in Washington State and Connecticut.

Methods: Telephone interviews were conducted with state-wide random samples of licensed naturopathic physicians and data were collected on consecutive patient visits in 1998 and 1999. The main outcome measures were: Sociodemographic, training and practice characteristics of naturopathic physicians; and demographics, reasons for visit, types of treatments, payment source and visit duration for patients.

Result: One hundred and seventy practitioners were interviewed and 99 recorded data on a total of 1817 patient visits. Naturopathic physicians in Washington and Connecticut had similar demographic and practice characteristics. Both the practitioners and their patients were primarily White and female. Almost 75% of all naturopathic visits were for chronic complaints, most frequently fatigue, headache, and back symptoms. Complete blood counts, serum chemistries, lipids panels and stool analyses were ordered for 4% to 10% of visits. All other diagnostic tests were ordered less frequently. The most commonly prescribed naturopathic therapeutics were: botanical medicines (51% of visits in Connecticut, 43% in Washington), vitamins (41% and 43%), minerals (35% and 39%), homeopathy (29% and 19%) and allergy treatments (11% and 13%). The mean visit length was about 40 minutes. Approximately half the visits were paid directly by the patient.

Conclusion: This study provides information that will help other health care providers, patients and policy makers better understand the nature of naturopathic care.

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This is an open-access article distributed under the terms of the Creative Commons Attribution License (http://creativecommons.org/licenses/by/2.0), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.
Background
The number of Americans using complementary and alternative medicine (CAM) rose from 34% to 42% from 1990 to 1997, with annual spending for CAM therapies in excess of $21 billion [1]. The majority of the research on the use of CAM services has focused on patients or consumers of CAM. Several patient characteristics have been found to be associated with increased CAM use including female gender, child-bearing age, above average income, above average education and diagnosis with a chronic or life-threatening condition [1-4]. Reasons why consumers seek care from CAM practitioners have also been identified. These include: the failure of conventional treatment to alleviate symptoms; psychological congruence between the individual’s belief system and the CAM therapy; individuals’ expectations that use of CAM will empower them by offering a greater sense of control over personal health care decisions; adverse effects of conventional therapies; and dissatisfaction with the care of conventional practitioners [1-3,5-8].

Although we now have some understanding of who seeks CAM care and why, relatively little is known about the actual practices of CAM practitioners including the type of patients they treat, the kinds of therapies they use, and the numbers of patients they see each day. In addition, it is unclear if the practice patterns of CAM practitioners vary by state. The objective of this paper is to describe and compare the practice of naturopathic physicians in two US states: Washington and Connecticut.

Naturopathic medicine
Naturopathic medicine is a system of health care, based on the teachings of Benedict Lust [9], with a primary goal of enhancing the individual’s innate self-healing ability by employing a variety of natural and largely non-invasive healing modalities. In some states, naturopathic physicians are authorized to employ more invasive interventions (i.e., prescription drugs, and minor surgery). Naturopathic medicine is defined by the American Association of Naturopathic Physicians (AANP) as:

... a distinct system of primary health care – an art, science, philosophy and practice of diagnosis, treatment and prevention of illness. Naturopathic medicine is distinguished by the principles upon which its practice is based. These principles are continually reexamined in the light of scientific advances. The techniques of naturopathic medicine include modern and traditional, scientific and empirical methods [10].

Naturopathic physicians are trained as generalists with expertise in a variety of core treatment methods including nutrition, hydrotherapy, colonic irrigation, physiotherapy, naturopathic manipulation, botanical medicine, homeopathy, pharmacology and minor office surgical procedures. Some licensed naturopathic physicians are also trained in traditional Chinese medicine, acupuncture and Ayurvedic medicine as well as clinical specialties such as natural childbirth [9,11-14]. There are currently six North American schools of naturopathic medicine whose graduates are eligible to sit state licensing examinations: Bastyr University (Seattle, WA), the Canadian College of Naturopathic Medicine (Toronto, ON, Canada), National College of Naturopathic Medicine (Portland, OR), Southwest College of Naturopathic Medicine (Tempe, AZ), the University of Bridgeport College of Naturopathic Medicine (Bridgeport, CT) (has applied for accreditation candidacy with the Council on Naturopathic Medical Education (CNME)), and the West Coast Naturopathic Medical College (Vancouver, BC) (not accredited by the CNME) [9].

Accurate estimates of the number of naturopathic physicians practicing in North America are difficult to obtain. A recent estimate (based on data from licensing bodies) indicated that in 2000 approximately 1300 licensed naturopathic physicians were practicing in the United States and another 500 were practicing in Canada. Naturopathic medicine is a licensed health care profession in twelve US states (Alaska, Arizona, Connecticut, Hawaii, Maine, Montana, New Hampshire, Oregon, Utah, Vermont, Washington, California), Puerto Rico and four Canadian provinces (British Columbia, Manitoba, Ontario and Saskatchewan) [9,15]. In most states and provinces where naturopathic medicine is not regulated, individuals may practice similar therapeutic approaches and/or call themselves naturopaths (whether or not they have been trained at a school for naturopathic medicine) because the term naturopathic medicine is not a restricted term. The number of individuals practicing in unregulated jurisdictions is unknown. In South Carolina and Tennessee, it is illegal to practice naturopathy [9].

Legal regulation of naturopathic medicine varies by state and province. Connecticut and Washington have relatively similar (and representative of the other ten states) requirements for licensure including: Graduation from an accredited four-year naturopathic medical school, successful completion of licensing examination (normally NPLEX), the submission of completed application forms and paying the required fee. In addition, Washington State requires that individuals be of good moral character with no history of unprofessional conduct [9].

The legal scopes of naturopathic practice in Connecticut and Washington are similar and relatively broad compared to the other states that license naturopathic physicians. Naturopathic physicians in these two states can diagnose and treat disease, utilizing a wide range of
modalities and specialties including: minor surgery such as suturing (limited in Washington); physical therapies including hydrotherapy, naturopathic manipulation, and physiotherapy; colonic irrigation; electrotherapy (for example TENs); diagnostic x-ray; venipuncture; obstetrics (in Washington a midwifery license is required); gynecology; botanical medicine; nutrition; and homeopathy. Naturopathic physicians in Washington may prescribe a limited range of drugs; however, this is not part of the scope of practice in Connecticut. The practice of acupuncture requires separate licensure in both states [9].

**Methods**

**Study design**

The data derive from a parent study of licensed acupuncturists, chiropractors, massage therapists and naturopathic physicians [16]. The study was conducted in two phases: 1) random samples of licensed naturopathic physicians were interviewed by telephone; 2) a sub-set of those interviewed were recruited to record detailed information on 20 consecutive patient visits. Data were collected for each practitioner group in two states (one in the West and one in the Northeast). The West and Northeast were selected because these are the regions where CAM practitioners are concentrated in the United States [14,17]. The data for naturopathic physicians were collected in Washington and Connecticut.

**Sample**

Licensing Boards provided contact information for all licensed naturopathic physicians in Washington (1998) and in Connecticut (1999) with in-state addresses. In total, 142 licensed practitioners were identified in Washington and 63 licensed practitioners were identified in Connecticut. Providers without identifiable telephone numbers, and those not currently practicing were excluded. The proportion of excluded providers was 11% in Connecticut and 29% in Washington. See Table 1 for additional sampling details.

**Data collection**

Research assistants conducted telephone interviews with the randomly selected providers in Washington State in 1998 and in all eligible practitioners in Connecticut in 1999. (Given the small number of eligible practitioners in Connecticut, all were contacted). Information about individual demographic characteristics (e.g., age, gender, race/ethnicity); training characteristics (e.g., duration, location); practice characteristics (e.g., length of time in practice, licensure in other health care professions, practice settings) was collected. To maximize the accuracy of state-wide estimates, data collection efforts were concentrated on high-volume practitioners: those with at least 20 patient visits per week. About 60% to 70% of practitioners had a high-volume practice and accounted for roughly 85% to 90% of all visits to the profession. The remaining practitioners were categorized as low-volume providers. While all high-volume practitioners were asked to collect data on 20 consecutive patient visits, only the first 10 low-volume practitioners were asked to collect data. The rationale was to collect only enough data from low-volume practitioners to ascertain whether their practices differed markedly from those of high-volume practitioners. It was ultimately decided, however, to weight data for high- and low-volume practitioners in a manner that produced annual estimates of visits in each state.

Naturopathic physicians who agreed to participate were asked to complete one-page encounter forms for 20 consecutive patient visits. No financial incentives were provided for participation in the study and the protocol was approved by the Group Health Human Subjects Review Committee and the Harvard Pilgrim Health Care "Committee on Clinical Investigations, New Procedures and New Forms of Therapy" prior to the commencement of data collection.

**Table 1: Selection and participation of naturopathic physicians (NDs) in Washington (1999) and Connecticut (1998)**

|                        | Connecticut (n = 59) | Washington (n = 111) |
|------------------------|----------------------|----------------------|
| NDs licensed in state  | 71                   | 286                  |
| NDs randomly selected  | 71                   | 200                  |
| NDs found eligible for | 63                   | 142                  |
| study*                 | 59                   | 111                  |
| Eligible NDs interviewed | 59                   | 111                  |
| Interviewed NDs eligible to collect | 55       | 93                   |
| visit data**           |                      |                      |
| Eligible NDs providing visit data | 34     | 65                   |
| Total patient visits reported | 631   | 1186                 |

* NDs confirmed to be practicing in state and to have verifiable and functioning phone number
** NDs who reported seeing 10 or more patients in a typical week

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**Table 2: Characteristics of naturopathic physicians licensed in Connecticut (1999) and Washington (1998)**

|                        | Connecticut (n = 59) | Washington (n = 111) |
|------------------------|----------------------|----------------------|
| **Demographics**        |                      |                      |
| Female                 | 58                   | 57                   |
| White                  | 95                   | 94                   |
| Mean Age (SD)          | 43.6 (8.7) years     | 44.1 (9.2) years     |
| **Education**           |                      |                      |
| Institution*           |                      |                      |
| Bastyr University       | 37                   | 80                   |
| National College        | 59                   | 20                   |
| Other                  | 3                    | 1                    |
| Specialty training*    | 69                   | 42                   |
| Licensed in other Health Profession* | 17 (acupuncture 10%; all others less than 2%) | 33 (chiropractic 8%; nursing 7%; acupuncture 6%; midwifery 5%; all others less than 2%) |
| Practice solo          | 51                   | 54                   |

*significant differences between the two states, chi square, p < 0.05
** significant differences between the two states, t-test, p < 0.05
arrangement); and workload characteristics (e.g., number of weeks in practice per year; hours per week of direct patient care) was obtained for each provider who agreed to be interviewed. Among those eligible to be interviewed, the participation rate was 94% in Connecticut and 78% in Washington.

Naturopathic physicians who were eligible to collect visit data (i.e., those who saw at least 20 visits per week plus a sample of those who saw at least 10 – 19 visits per week) were asked to complete encounter forms for 20 consecutive patient visits. (Only 2% of all visits were provided by naturopathic doctors with less than 10 visits per week.) Those who agreed were mailed encounter forms that were modeled after those used by the National Ambulatory Medical Care Survey (NAMCS) [18]. Each naturopathic physician was instructed to return the encounter forms by mail to the study center after completing them. Those who failed to promptly return their forms received a reminder telephone call. Among those eligible to collect visit data, 62% of naturopathic doctors in Connecticut and 70% of naturopathic doctors in Washington provided visit data.

Analysis
Descriptive statistics (means, standard deviations, frequencies) were used to present the practitioner characteristics in Table 2. In the analyses of visit characteristics (Tables 4 and 5), each visit in the sample was weighted by the inverse of the sampling probability, reflecting both the chance that the particular provider participated and the estimated proportion of that provider’s annual visits included in the study. Consequently, our results represent estimates of all visits made to naturopathic physicians in each state except for the roughly 2% of visits made to practitioners with the lowest volumes [16].

Table 3: Practices of naturopathic physicians licensed in Connecticut (1999) and Washington (1998)

|                          | Connecticut (n = 59) | Washington (n = 110) |
|--------------------------|---------------------|----------------------|
| Median number of years in practice | 9                   | 7                    |
| Patient care hours in a typical week |                     |                      |
| Mean (S.D.)              | 25.8 (10.6)         | 24.5 (12.2)          |
| Percentage reporting: 1–14 hours | 10.2                | 20.0                 |
| 15–24 hours              | 32.2                | 30.0                 |
| 25–34 hours              | 39.0                | 26.4                 |
| 35–44 hours              | 15.2                | 17.2                 |
| 45+ hours                | 3.4                 | 6.4                  |
| Patient visits in a typical week |                     |                      |
| Mean (S.D.)              | 32.7 (18.9)         | 30.5 (24.7)          |
| Percentage reporting: 1–19 visits | 20.7                | 34.6                 |
| 20–29 visits             | 31.0                | 21.8                 |
| 30–39 visits             | 13.8                | 21.8                 |
| 40–49 visits             | 13.8                | 9.1                  |
| 50+ visits               | 20.7                | 12.7                 |

Table 4: Characteristics of visits to naturopathic physicians in Connecticut (1999) and Washington (1998)

|                          | Connecticut (n = 631 visits) | Washington (n = 1186 visits) |
|--------------------------|------------------------------|------------------------------|
| Gender                   |                              |                              |
| female                   | 76                            | 74                            |
| Age                      |                              |                              |
| Median                   | 43 years                      | 42 years                      |
| 0–15 years               | 12.8                          | 10.9                          |
| 16–34 years              | 16.4                          | 20.9                          |
| 35–64 years              | 63.0                          | 58.5                          |
| 65 years+                | 7.8                           | 9.7                           |
| Race                     |                              |                              |
| White                    | 97                            | 96                            |
| Smoking status:          |                              |                              |
| non-smokers              | 95                            | 94                            |
| Type of major problema   |                              |                              |
| Acute problem            | 22                            | 23                            |
| Chronic problem, routine | 53                            | 56                            |
| Chronic problem, flare up| 20                            | 18                            |
| Pre/post-surgery/injury  | 1                             | 1                             |
| Non-illness care         | 5                             | 6                             |
| Primary reason for visitb|                              |                              |
| Fatigue                  | 6.1                           | 6.0                           |
| Headache                 | 4.4                           | 3.8                           |
| Back symptoms            | 4.4                           | 6.5                           |
| Skin rashes              | 4.2                           | 2.5                           |
| Menopausal symptoms      | 3.7                           | 2.0                           |
| Bowel function changes   | 3.5                           | 2.0                           |
| Anxiety or Depression    | 3.2                           | 5.1                           |
| Allergies to food, milk  | 3.0                           | 3.6                           |
| Sinus symptoms           | 2.8                           | <2                            |
| Upper respiratory symptoms| 2.6                          | <2                            |
| Cough                    | 2.4                           | <2                            |
| Neck symptoms            | 2.3                           | 3.3                           |
| Infectious disease       | 2.2                           | <2                            |
| Ear infection symptoms   | 2.2                           | <2                            |
| Abdominal pain/cramps    | 2.2                           | 2.7                           |
| Menstrual problems       | <2                            | 2.1                           |
| Diagnosis by naturopathic physicianc |           |                              |
| Menopausal disorders     | 4.9                           | 3.1                           |
| Allergies                | 4.6                           | 6.3                           |
| Back conditions          | 3.5                           | 5.8                           |
| Fibromyalgia             | 3.0                           | 2.0                           |
| Sinusitis                | 2.9                           | <2                            |
| Fatigue                  | 2.4                           | 2.7                           |
| Headache                 | 2.2                           | 3.1                           |
| Upper respiratory infections| 2.0                         | <2                            |
| Neck conditions          | <2                            | 3.3                           |
| Depression               | <2                            | 2.6                           |
| Asthma                   | <2                            | 2.2                           |
| Anxiety                  | <2                            | 2.1                           |
| Dermatitis               | <2                            | 2.0                           |
| New patients             | 22                            | 22                            |
| Payment                  |                              |                              |
| Private insurance        | 60                            | 43                            |
| Worker’s compensation    | 0                             | 3                             |
| Personal injury          | 0                             | 3                             |
| Self-pay                 | 37                            | 48                            |
| Other                    | 3                             | 3                             |

a Because 3% to 4% indicated multiple reasons, total percentages exceed 100%
b Patient report; only reporting reasons totaling 2% or more of visits
c Based on ICD 9 criteria; only reporting diagnoses totaling 2% or more of visits
Given the large sample sizes (631 and 1186), the weighted percentages presented in the tables have small standard errors, generally between 0.5 and 2.5 percentage points and rarely exceeding 3 percentage points. As a result, moderate to large differences between the states are also statistically significant and we do not include standard errors in the tables.

**Results**

**Naturopathic physician participants**

The demographic characteristics of the naturopathic physicians in Washington State and Connecticut were remarkably similar (see Table 2). Just over half were female, with mean ages of about 44 years. Over 90% of naturopathic physicians identified themselves as White.

The majority of practitioners (80%) in Washington State trained at Bastyr University in Seattle, while most practitioners in Connecticut trained at National College of Naturopathic Medicine in Portland, Oregon. Although naturopathic doctors in Connecticut were more likely to report advanced specialty training (such as homeopathy), those in Washington were more likely to be licensed in another health profession. Washington naturopathic physicians were most often also licensed in chiropractic (8%), nursing (7%), acupuncture (6%) and midwifery (5%), while Connecticut naturopathic physicians were most often also licensed in acupuncture (10%). Almost one-quarter (22.5%) of naturopathic doctors licensed in Washington had completed at least one year of post-graduate residency training compared with only 8.5% of those in Connecticut. (Residency training is not required for licensure in either state.)

Both groups graduated from 4–5 year accredited full time programs of naturopathic medical education and the resulting naturopathic practice characteristics were reported to be very similar across the two states (Tables 2 and 3). Just over half of the practitioners in both states practiced solo, averaged approximately 25 hours per week providing direct patient care and saw an average of just over 30 patient visits per week. Practitioners who reported seeing less than 10 patients per week were excluded from this study.

**Characteristics of patients who see naturopathic physicians**

As was the case for the practitioners, patients of naturopathic physicians in the two states were remarkably similar (Table 4). About 75% of patients were female, about 95% were White and non-smokers, and the mean age of the patients was 41 years. Just over 50% of visits were for chronic conditions, followed in frequency by acute problems and flare-ups of chronic problems. There was extensive overlap in the most common presenting complaints (based on ICD 9 classification) in Connecticut and Washington with fatigue, headache, back symptoms among the top four in both states. However, there was a wide variety

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**Table 5: Characteristics of visits to naturopathic physicians in Connecticut (1998) and Washington (1999)**

| Table 5: Characteristics of visits to naturopathic physicians in Connecticut (1998) and Washington (1999) |
| --- |
| | Connecticut (n = 631 visits) | Washington (n = 1186 visits) |
| **Diagnostics/Screen Services:** | | |
| Examinations | | |
| Vitals (BP, pulse, temp) | 28 | 39 |
| HEENT | 18 | 15 |
| Complete physical | 13 | 9 |
| Mental Status | <5 | 6 |
| Imaging | | |
| x-ray | 1 | 2 |
| ultrasound | 1 | 1 |
| Blood tests | | |
| Complete blood count | 7 | 10 |
| Serum chemistry | 7 | 9 |
| Thyroid | 3 | 7 |
| Lipids panel | 4 | 5 |
| Allergy | 4 | 2 |
| **Additional Tests:** | | |
| Stool analysis | 5 | 4 |
| Urine analysis | 4 | 2 |
| Vitamin/Mineral | 3 | 0 |
| Endocrine | 1 | 2 |
| Allergy Skin test | 1 | 1 |
| TB skin test | 1 | 0 |
| **Therapeutics and Preventive Services:** | | |
| Naturopathic Therapeutics | | |
| Botanical medicine | 51 | 43 |
| Vitamins | 41 | 43 |
| Minerals | 35 | 39 |
| Homeopathy | 29 | 19 |
| Acupuncture | 14 | 4 |
| Allergy treatment | 11 | 13 |
| Glândular therapies | 4 | 13 |
| Physical Therapies | | |
| Naturopathic manipulation | 8 | 15 |
| Physiotherapy | 1 | 13 |
| Hydrotherapy | 4 | 10 |
| Ultrasound | 2 | 9 |
| Mechanotherapy | 2 | 7 |
| Counseling/Education | | |
| Therapeutic diet | 26 | 36 |
| Self-care education | 17 | 23 |
| Exercise therapy | 9 | 12 |
| Mental Health | 4 | 6 |
| **Visit disposition:** | | |
| No follow-up planned | 5 | 4 |
| Return if needed | 18 | 21 |
| Return at specified time | 77 | 74 |
| | | |
| **Visit Duration:** | | |
| Mean, minutes | 40 | 44 |
| <15 minutes | 1 | 3 |
| 15–29 minutes | 14 | 20 |
| 30 to 44 minutes | 49 | 31 |
| 45–59 minutes | 15 | 18 |
| >/=60 minutes | 20 | 28 |

* Totals add to more than 100% because multiple responses were allowed.
in the presenting complaints recorded; the most common presenting complaint was identified by less than 7% of patients in both states. More than one of every five visits was made by a new patient. Overall, approximately half the visits were paid for by private insurers and a similar percentage were paid directly by the patient. Visits in Connecticut were slightly more likely to be covered by insurance (60% vs 49% of visits).

**Characteristics of naturopathic medical visits**

More than 70% of visits included examinations or the ordering of diagnostic or screening tests (Table 5), most often: assessment of vital signs (including blood pressure, pulse and temperature), and Head, Eyes, Ears, Nose, Throat (HEENT) assessment (typically done for upper respiratory symptoms). The most common blood tests ordered in both states were: complete blood counts and serum chemistry. Imaging and other types of diagnostic tests were used for no more than 5% of visits in both states.

Therapeutic and preventive modalities were used in most visits (96%) in both states. The most common naturopathic therapeutics used in both states were: botanical medicines, vitamins, minerals, homeopathy and allergy treatments (Table 5). In addition, glandular therapies were prevalent in Washington (13% of visits) and acupuncture was prevalent in Connecticut (14% of visits). The only physical therapies that are part of the naturopathic scope of practice used in more than 5% of the visits were naturopathic manipulation, physiotherapy (Washington only) and hydrotherapy (Washington only). Twenty-six per cent of visits in Connecticut included counseling or education compared with 36% of visits in Washington. Most often this included discussion of a therapeutic diet.

Three-quarters of all visits in both states resulted in a recommendation that the patient return at a specified time (Table 5). The mean length of visit in the two states was similar (40–44 minutes), but there was greater variability in the length in Connecticut.

A wide range of generally similar commercially packaged products (including herbs, vitamins and minerals) were used by naturopathic physicians in the two states (Table 6). Connecticut providers recommended about 50% more than Washington providers. Almost all of the top 15 commercially packaged products used in both states were vitamins and minerals as single agents or as combinations. The most common commercially packaged products were about 1.5 to 2.0 times more likely to be used in Connecticut compared to Washington. In addition, zinc and vitamin B6 were more likely to be used by NDs in Connecticut, while protomorphogens and vitamin B12 were more commonly used in Washington. (A protomorphogen is thought to be that component of the cell chromosome that is responsible for morphogenic (forming of body and organs) determination of cell characteristics. [http://www.nbizz.com/naturalhealthdoc/listings/353.html](http://www.nbizz.com/naturalhealthdoc/listings/353.html) Theories about what protomorphogens are, as well as their role in health and disease continue to be debated.)

**Table 6: Most common commercially packaged products used by naturopathic practitioners in Connecticut (1998) and Washington (1999)**

| Product                | Connecticut (n = 631 visits) | Washington (n = 1186 visits) |
|------------------------|------------------------------|------------------------------|
| Number of Products Used per visit | 0 to 28                      | 0 to 26                      |
| Range                  | 0 to 28                      | 0 to 26                      |
| Median                 | 3.0                          | 2.0                          |
| Mean                   | 4.1                          | 2.7                          |
| Most Common Commercially Packaged Products<sup>a</sup> (weighted percent of visits) | 26.7                          | 9.1                          |
| Multivitamins          | 22.3                         | 13.2                         |
| Magnesium              | 16.3                         | 9.1                          |
| Combination vitamin and mineral | 16.2                         | 10.0                         |
| Calcium                | 15.8                         | 9.3                          |
| Vitamin C              | 15.1                         | 10.2                         |
| Minerals, NOS<sup>b</sup> | 9.4                          | 7.7                          |
| Zinc                   | 9.0                          | <5                           |
| Multiminerals          | 8.4                          | 7.8                          |
| Vitamins, NOS<sup>b</sup> | 8.4                          | 10.5                         |
| Vitamin E              | 7.9                          | 5.2                          |
| Bioflavonoids          | 7.1                          | 5.9                          |
| Vitamin B6             | 5.9                          | <5                           |
| Coenzyme Q10           | 5.8                          | <5                           |
| Selenium               | 5.2                          | <5                           |
| Protomorphogen         | <5                           | 9.0                          |
| Vitamin B12            | <5                           | 7.4                          |

<sup>a</sup> Excluding diets and foods; reporting only those with a weighted percent >5%

<sup>b</sup> NOS = Not Otherwise Specified

**Discussion**

Given the broad scopes of practice of naturopathic medicine in Washington and Connecticut, the similarities in the practitioner characteristics, patient characteristics and practice characteristics in Washington State and Connecticut are remarkable. The finding that naturopathic medicine is primarily a white and female profession is consistent with other recent studies of naturopathic physicians in the United States and Canada [19,20]. Substantial fractions of naturopathic doctors, especially in Washington, are licensed in other CAM and conventional professions. Practitioners spend about 25 hours per week in patient care and see approximately 32 patients/week, which is slightly more than was reported in a recent Canadian study [20]. In comparison, according to the American Medical Association, general practitioners in the United States spend approximately 51.3 hours/week...
providing direct patient care and see approximately 125 patients in a typical week [16].

Patients who visit naturopathic physicians are primarily female, white, middle aged, non-smokers. In many ways they are demographically similar to the naturopathic physicians themselves. Patients present to naturopathic physicians with a broad range of complaints and are diagnosed by the practitioners with a wide variety of conditions. It should be noted that much of naturopathic practice is focused on chronic problems, particularly those exclusively or primarily presented by women (e.g., fatigue, headache, symptoms associated with menopause, depression). In fact 75% of all visits are made by women. The most common “reasons for visits” identified in this study were very similar to those noted in a Canadian study [20], suggesting that this sample of provider visits may be representative of naturopathic patient visits across North America.

Other than physical examination, blood tests and stool analysis, naturopathic practitioners use few diagnostics tests. However, they commonly recommend commercially packaged natural products such as herbal medicines, vitamins and minerals. Naturopathic practice also involves significant amounts of patient counseling and education. Overall, naturopathic physicians spend more than twice as much time with patients as conventional physicians at each visit (40 minutes vs. 14 minutes) [16], permitting more time to discuss patients’ concerns and counseling/education about lifestyle issues such as diet.

Data from this and previous studies [19,20] indicate that patients visit naturopathic physicians for a wide range of conditions and are given a correspondingly wide range of therapies and treatments as part of their naturopathic care. This diversity makes it difficult to describe a "typical" naturopathic medical consultation and to develop standardized research protocols for studies evaluating naturopathic treatments.

Our results also have implications both for naturopathic physicians and the American health care system. They indicate that naturopathic physicians treat a broad range of health problems. The results from our study provide baseline data for tracking changes as the practice of naturopathic medicine evolves over time across the US in response to increasing research into the safety, efficacy and cost-effectiveness of naturopathic treatments, as well as to changes in the social, economic and regulatory environment.

**Strengths and limitations of the study**
The major strengths of this study are its large sample size, relatively high participation rates, and the ability to compare naturopathic physicians from two geographically distant states. The main limitation is that despite the similarities of the states studied, it is not known if the results are representative of the other ten states where naturopathic medicine is licensed. These two states reflect typical licensing requirements prevalent throughout the US. Washington State has one of highest numbers of licensed naturopathic physicians in the US, while the number of naturopathic physicians in Connecticut is significantly smaller, and more representative of, most other licensed states.

Another limitation of the survey was its inability to accurately capture the use of office-compounded tinctures and powders. Our results highlight the use of bottled products as a major part of naturopathic practice; however, the practitioners’ use of their own combination preparations was difficult to record on the data collection forms. This aspect of practice is likely under-reported in our data.

**Conclusion**
Naturopathic physicians and their practices in Washington and Connecticut, two geographically distinct states, are similar. This study provides baseline data for describing and tracking the practice patterns and scope of practice of naturopathic physicians over time and will help inform researchers and policy makers considering the regulation of this profession in other states. It also helps conventional physicians, other health care providers and patients better understand the nature of naturopathic care.

**Competing interests**
The authors declare that they have no competing interests.

**Authors’ contributions**
HB conceptualized and drafted the manuscript. DC conceptualized the overall project, designed and directed collection of the original data and participated in the conceptualization of this manuscript, and analysis of this data. KS participated in the design of the overall project and this manuscript, and participated in the statistical analyses. JE helped to conceptualize the overall project, directed the data collection, quality control, and participated in the analyses for this paper. BM, JB, EC, and DE helped to conceptualize the overall project including the data collection. MS helped to conceptualize this paper. RD helped to conceptualize the overall project, design data collection procedures, and secure funding. All critically edited drafts of this manuscript and approved the final manuscript.

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References

1. Eisenberg DM, Davis RB, Ettner SL, Appel S, Wilkey S, Van Rompay M, Kessler RC: Trends in alternative medicine use in the United States, 1990-1997: Results of a follow-up national survey. JAMA 1998, 280:1569-1575.

2. Boon H, Stewart M, Kennard MA, Gray R, Sawka C, Brown JB, McWilliam C, Gavin A, Baron RA, Aaron D, Haines-Kamka T: The use of complementary/alternative medicine by breast cancer survivors in Ontario: Prevalence and perceptions. Journal of Clinical Oncology 2000, 18:2515-2521.

3. Zollman C, Vickers A: ABC of complementary medicine. Users and practitioners of complementary medicine. Brmj 1999, 319:836-838.

4. Lerner IJ, Kennedy BJ: The prevalence of questionable methods of cancer treatment in the United States. CA-A Cancer Journal for Clinicians 1992, 42:181-191.

5. Fernandez CV, Stutzer CA, MacWilliam L, Fryer C: Alternative and Complementary Therapy Use in Pediatric Oncology Patients in British Columbia: Prevalence and Reasons for Use and Nonuse. Journal of Clinical Oncology 1998, 16:1279-1286.

6. Risberg T, Kaasa S, Wist E, Melsom H: Why are cancer patients using non-proven complementary therapies? A cross-sectional multicentre study in Norway. European Journal of Cancer 1997, 33:575-580.

7. Yates P, Beadle G, Clavarino A, Najman JM, Thomson D, Williams G, Kenny L, Roberts S, Mason B, Schlect D: Patients with terminal cancer who use alternative therapies: Their beliefs and practices. Sociology of Health and Illness 1993, 15:199-117.

8. Zollman C, Vickers A: ABC of complementary medicine. Complementary medicine and the patient. British Medical Journal 1999, 319:1486-1489.

9. Hough HJ, Dower C, O’Neil EH: Profile of a Profession: Naturopathic Practice. San Francisco, CA, Centre for the Health Professions, University of California, San Francisco; 2001.

10. American Association of Naturopathic Physicians: AANP Definition of Naturopathic Medicine: Adopted November 1, 1989, Rippling River Convention. Seattle, Washington; 1998.

11. Boon Heather: Canadian Naturopathic Practitioners: The Effects of Holistic and Scientific World Views on Their Socialization Experiences and Practice Patterns. In Faculty of Pharmacy Toronto, University of Toronto; 1996:290.

12. Boon Heather: Licensed naturopathic medicine in Canada today: A national profile. In Alternative Health Care in Canada Nineteenth- and Twentieth-century Perspectives Edited by: Crellin JK, Anderson RR and Connor JTH. Toronto, Canadian Scholars’ Press Inc.; 1996:172-183.

13. Boon H: The holistic and scientific orientations of Canadian naturopathic practitioners. Social Science and Medicine 1998, 46:1213-1225.

14. Baer HA: The sociopolitical status of US naturopathy at the dawn of the 21st century. Medical Anthropology Quarterly 2001, 15:329-246.

15. KRON News: Naturopaths Get Licensed to Heal in CA; http://www.kron.com/Global/story.asp?S=1836576.

16. Cherkin DC, Deyo RA, Sherman KJ, Hart LG, Street JH, Hrbek A, Davis RB, Cramer E, Millman B, Booker J, Mootez RD, Barassi J, Kahn JR, Kapchuk TJ, Eisenberg DM: Characteristics of visits to licensed acupuncturists, chiropractors, massage therapists, and naturopathic physicians. J Am Board Fam Pract 2002, 15:463-472.

17. Cooper RA, Stoffel S: Trends in the education and practice of alternative medicine clinicians. Health Affairs 1996, 15:226-238.

18. Schneider D, Appleton L, McLemore T, National Centre for Health Statistics: A Reason for Visit Classification for Ambulatory Care. Washington, DC, Public Health Service, Government Printing Office; 1979.

19. Standish LJ, Green K, Greenlee H, Kim JG, Grosshans C: Complementary and alternative medical treatment of breast cancer: A survey of licensed North American naturopathic physicians. Altern Ther Health Med 2002, 8:74-81.

20. Verhoef MJ, Boon HS, Smith MJ: Naturopathic Medicine: Training and Scope of Practice. Journal of Herbal Pharmacotherapy 2003, 3:67.

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