
SECTION 3: PRACTICE AND IMPLEMENTATION OF NATUROPATHY IN HEALTH CARE SYSTEMS

Amie Steel, ND PhD

HIGHLIGHTS

- Direct risks associated with naturopathic care have been reported very infrequently and the vast majority are minor.
- Naturopathic care is cost-effective, particularly for longer-term and chronic conditions and for persons with higher disease burden.
- Naturopaths/NDs provide health care for diverse chronic and acute health conditions throughout all stages of life and support preventive and palliative care with three out of four patients seeking naturopathic care to address non-communicable diseases.
- Although the naturopathic workforce has a significant presence globally, there are limited data on the prevalence of naturopathic consultations. It is estimated that the global naturopathic workforce sees over 5.5 million patients per month.
- There are more than 100 naturopathic community clinics around the world that provide care to marginalized and underserved populations.
- Naturopaths/NDs are actively engaged in various forms of community education and health promotion activities and can support public health initiatives aimed at increasing community health literacy.
- Naturopaths/NDs employ diverse knowledge and information in clinical practice, and actively mobilize knowledge to – as well as from – others.

There is extensive evidence describing clinical outcomes associated with naturopathic therapeutic modalities and practices, and a broad evidence base examining many other aspects of naturopathic practice providing a guide for how naturopathy/naturopathic medicine might fit into the global healthcare system.

Policymakers and other stakeholders seeking to understand how best to optimize the health workforce and integrate naturopaths/naturopathic doctors into their policies, programs, and services for community benefit must consider this evidence within the context of contemporary naturopathic practice. The following are the highlights of chapters in this section.

Safety and Risks of Naturopathic Practice (Chapter 7) describes the main categories of risk associated with naturopathic practice, and reports that these are similar to any other health profession that employs a broad scope of practice. Risks associated with naturopathic practice primarily result from naturopaths'/naturopathic doctors' primary care practice context and their 'tools of trade'.

- Direct risks associated with naturopathic care have been reported very infrequently and the vast majority are minor.
- Other risks presented by the naturopathic

profession include rogue practitioners and misrepresentation of naturopathic care by co-option of the title 'naturopath'. The latter is further impacted by issues of licensure for the naturopathic profession, and inaccurate reporting in media.

Economics of Naturopathic Care (Chapter 8) provides a review of the cost-effectiveness of naturopathic care. The few economic evaluations of naturopathic interventions that have been conducted have reliably shown naturopathic care to be cost-effective, particularly for longer-term and chronic outcomes, and for persons with higher disease burden.

- Studies suggest societal economic benefits from naturopathic care, such as improved presenteeism and reduced absenteeism, and lower overall insurance costs per person. Integration of complementary therapies in multidisciplinary settings has also shown the ability to reduce costs of care while delivering equal or better clinical outcomes in general inpatient populations, oncology patients and pain patients, and such findings are suggestive of a potentially beneficial role for naturopaths/naturopathic doctors in integrative multidisciplinary settings.
- Naturopathic care globally is primarily covered by

third party insurers or out-of-pocket costs borne by consumers, rather than by government-funded programs. Multiple countries incorporate government-funded naturopathic care in limited circumstances, either for specific populations (e.g., veteran care) or circumstances (e.g., worker's compensation).

The **International Survey of Naturopathic Patients and Practices (Chapter 9)** presents an excerpt from a peer-reviewed research article titled, "*Overview of international naturopathic practice and patient characteristics: results from a cross-sectional study in 14 countries*" and describes the practice behaviours of the naturopathic workforce and the characteristics of their patients.

- Naturopaths/NDs treat a wide range of conditions with over 70% of patients presenting with chronic conditions.
- Naturopaths/NDs also treat acute conditions and focus on preventive and palliative care.
- A typical naturopathic visit will generally involve the prescription, recommendation or use of an average of four different naturopathic treatments, therapies, or practices.
- Naturopaths/NDs treat a wide range of health conditions both as primary care practitioners and in collaboration with other healthcare providers.

International Prevalence of Consultations with a Naturopath/Naturopathic Doctor (Chapter 10) reviews the available research reporting prevalence of consultations with a naturopath/naturopathic doctor in the general population. Although the naturopathic workforce has a significant presence globally, there is limited data on the prevalence of naturopathic consultations.

- The 12-month prevalence of consultations with a naturopath/naturopathic doctor ranged from 1% of the general population in the USA to 6% in the European and Western Pacific Regions, though there are significant differences between and within Regions, which may be driven by a range of policy, legislative and social factors.

Access and Equity in Naturopathic Care (Chapter 11) is an abridged version of the peer-reviewed research article "*Naturopathic community clinics: international cross-sectional survey*" which discusses the essential role of naturopathic community clinics (NCCs) in providing free or low-cost naturopathic care.

- There are over 100 NCCs globally. NCCs have been offered through various naturopathic educational institutions for over three decades.
- NCCs reach underserved, vulnerable, and marginalized populations such as low-income families, immigrants, refugees, people experiencing

homelessness, indigenous peoples, people with HIV/AIDs and those dealing with addictions or drug use as well as individuals from diverse genders including transgender and non-binary.

- NCCs provide naturopathic care that is similar to that delivered in general naturopathic practice treating both chronic and acute conditions.
- Gastrointestinal, mental health, endocrine and musculoskeletal conditions are the most common presenting concerns of individuals visiting NCCs.

Community Education and Health Promotion Activities (Chapter 12) presents the results of the peer-reviewed research article, "*Community education and health promotion activities of naturopaths/naturopathic doctors: results of an international cross-sectional survey*" and reports the community education and health promotion efforts of naturopaths/ naturopathic doctors.

- Naturopaths/NDs use several educational tools, often at no cost to patients and consumers, to improve health literacy. The tools used focus on ways to change health behaviours, to provide self-care guidelines, to manage health concerns and to prevent future health issues.
- The main types of tools include information sheets and handouts, social and professional network communications and information talks for members of the community.
- Research indicates that individuals who visit with a naturopath/ND may be more motivated to engage in positive health behaviours. This combination of patient-centered education and a motivated patient group may mean the community education activities undertaken by naturopathic practitioner have a marked impact in their patient population.

The Mobilization of Knowledge and Information in Naturopathic Clinical Practice (Chapter 13) chapter is an abridged version of a peer-reviewed research article titled, "*Naturopath's mobilization of knowledge and information in clinical practice: an international cross-sectional survey*" and examines the way naturopaths/naturopathic doctors use and share knowledge and information in clinical practice.

- Naturopaths/NDs draw knowledge from a diverse range of information sources to inform their clinical decision-making including published research, traditional knowledge, clinical experience, and the patient's expertise regarding their own health condition.
- Naturopaths/NDs report actively sharing their knowledge with patients and the wider community, suggesting they may act as knowledge brokers.

7

Safety and Risks of Naturopathic Practice

Jon Wardle, ND PhD

HIGHLIGHTS

- Direct risks associated with naturopathic care have been reported very infrequently and the vast majority are minor.
- Unlicensed practitioners appear to have a higher risk profile.
- Co-option of the term “naturopath” has occurred in jurisdictions without occupational licensing which exposes the public to increased risks.
- Analysis of media reports concerning the risks of naturopathic care suggests reports have often been critical without justification to the merits of the situation being discussed or containing objective analysis.
- Naturopathic practice when performed by a professional and qualified naturopathic practitioner is safe, and patient safety is highly dependent on the educational standards and regulatory settings within jurisdictions.

To fully appreciate and appraise the relative merits of any practice and the provision of any health intervention, decision-makers need to be mindful that a range of potential risks may be associated with its use. All forms of health care have some form of risk that must be considered when comparing to potential benefits and determining appropriate use. Preventable risks are minimized when adequate clinical, regulatory and policy frameworks are put in place. Naturopathy/naturopathic medicine is no exception, with regulation of its practice being an effective tool in minimizing risks [1]. The main types of risk associated with naturopathic practice are similar to those from any other health profession that employs a broad scope of practice and results primarily from tools of trade and the primary-care context within which they work [2, 3]. However, in jurisdictions with no regulatory oversight, misrepresentation of naturopathic care by non-naturopaths also presents a risk to the public.

Although the focus of naturopathic practice on lower risk interventions means that naturopathic practice can be considered a relatively safe and low-risk practice, some harms may occasionally occur. This review focuses on the evidence that specifically reports adverse events and harms from naturopathic practice. It includes evidence regarding the adverse events and complications arising from naturopathic practice, identified through a systematic search of published literature, case reports and legal databases.

Risks Associated with Naturopathic Care

The following section outlines contemporary research that focuses on the risks of naturopathic care. It includes a workforce study that was conducted in Australia, a review of case studies that have highlighted risks or adverse reactions, an overview of the naturopathic published case studies that included adverse reactions in the findings, identified cases related to rogue practitioners and a summary of the deaths due to naturopathic care that have been reported.

Risk Classifications

Risk can be classified as *direct*, *indirect* or *non-health risks* [4]. **Direct risks** are directly associated with the provision of health care and have been reported very infrequently in naturopathy/naturopathic medicine. Examples of direct risks relevant to naturopathy/naturopathic medicine are potential hepatotoxicity or interactions from use of botanical medicines or burns from treatments involving the application of heat. As a therapeutically eclectic profession with a broad primary health care scope of practice, each therapeutic modality or practice used by naturopaths/naturopathic doctors has its own inherent associated risks. **Indirect risks** are those risks not caused by medical intervention or errors of planning or execution, often termed as acts of omission [5]. Indirect

risks include opportunity costs caused by monopolization of care resulting in underuse or rejection of other effective health services and quality issues such as delayed diagnosis, failure to provide indicated treatments, or employing sub-therapeutic doses of medicines. *Non-health risks* are also possible and are defined as risks of using health services that harm the patient or consumer in ways not related to health – most commonly manifesting as economic harm as the result of healthcare costs or financial exploitation of patients.

Adverse Events from a Naturopathic Whole Practice Study

A large Australian national workforce study exploring the rate of adverse events from naturopathic practice was conducted as part of a larger project examining the regulatory requirements for the naturopathic profession in the state of Victoria [6]. Five survey items related to adverse events in naturopathy as a whole practice and specifically for the practices of clinical nutrition and herbal medicine. Naturopaths/naturopathic doctors were requested to indicate the number of times an adverse event had occurred over their time in practice. The most common adverse events that study participants reported were mild gastrointestinal symptoms (44.7% of all reported adverse events), headache (9.1%), significant skin reaction (4.2%), significant gastrointestinal symptoms such as vomiting and nausea (2.9%) or pain (2.8%). Referral to hospital services was required for 82 (1.1%) of the reported adverse events. Analysis of survey results from 859 naturopaths suggested that a naturopath in Australia had on average 1.2 adverse events per person-year and 2.3 adverse events for every 1,000 consultations. It should be noted, though, that mild gastrointestinal symptoms were excluded from this analysis so more serious adverse events could be given due attention. The stated figures would almost double if mild gastrointestinal symptoms had been included. Such numbers indicate that there is risk of potential harm from naturopathy/naturopathic medicine when practiced inappropriately. However, these results compare favourably to studies of conventional medical primary care, where long-term studies have identified at least 6.0 adverse events per 1000-person years [7], or with traditional Chinese medicine with 75.4 adverse events per 1000 consultations, largely related to acupuncture [8].

Case Studies Reporting Adverse Events due to Naturopathic Care

Eight research case reports have been published in the peer-reviewed literature that focused on adverse events

from naturopathic practice. The reports were from the USA (n=4), Australia (n=1), Germany (n=1), Canada (n=1), and Hong Kong (n=1). The adverse events reported arose from inappropriate use of or harm from specific therapies (herbal medicine [n=4], clinical nutrition [n=3] and delayed care causing harm [n=1]). The following is a summary of those findings:

- One USA case report presented evidence of burns and cellulitis arising from a naturopathic recommendation of a raw garlic poultice applied to the feet [9].
- A German case reported a severe *Serratia liquefaciens* sepsis following intravenous vitamin C infusion by a naturopathic doctor due to poor hygiene practices [10].
- An Australian case report highlighted a case of a head injury that progressed to a massive erosive lesion after the treating naturopath had eschewed other treatments in favour of comfrey poultices and dietary therapies [11].
- A Hong Kong case report of *Torsade de Pointes* (a potentially fatal form of ventricular tachycardia) was reported in a patient after being prescribed nonradioactive caesium chloride for treatment of cancer by a naturopath [12].
- A USA case report of chronic hyperpigmentation arose from a burn due to a naturopathic prescription of a heated mustard compress [13].
- A USA case report of venous thrombosis, hyperthyroidism and gonadotrophic deficiency was attributed to supplement medicine use prescribed by a naturopath as part of an anti-ageing regime [14].
- A USA case report of hepatic mucormycosis (fungal infection) in a bone marrow transplant patient was due to the ingestion of concentrated mushroom extracts provided by a naturopath [15].
- A Canadian case reported an incident of drug-induced hepatitis secondary to the use of a complex supplement regime prescribed by a naturopath [16].

In the literature there were additional case reports of adverse events for “naturopathic” products or practices that, upon further analysis, were not associated with naturopathic practice. For example, a recent review identified several case studies that identified practices or products as naturopathic, despite being self-prescribed or used by other health professionals (e.g. conventional medical practitioners) [17]. These were often the result of “naturopathic” being used as a synonym for natural medicine, rather than having any link with naturopathic practice or with a specific naturopath/naturopathic doctor.

Adverse Event Reporting from Naturopathic Research

Case reports are one of the preferred outlets for

documenting adverse events in the published literature [18]. In 2017, a review of eighteen naturopathic case studies found that approximately one-third related to the reporting of adverse events [17]. In the analysis of the original clinical research conducted by naturopathic researchers (see Sections 5 and 6), a number of studies assessed for adverse reactions and most trials reported no severe or clinically significant adverse events, or no difference in adverse reactions in either control or naturopathic intervention group [19]. Some individual naturopathic studies also reported adverse events of specific therapies or interventions. These included results that indicated worsened symptoms scores on the primary outcome, and included increased chemotherapy-induced peripheral neuropathy associated with acetyl-L-carnitine prescription [20], which persisted even after two years [21]; and increased progression to heart failure associated with a herbal intervention (*Crataegus* special extract WS 1442) that was prescribed with the aim to improve cardiac outcomes [22]. Other studies identified adverse events unrelated to primary outcome, including: an isolated episode of anxiety in a woman with breast cancer receiving freeze-dried extract of the mushroom *Trametes versicolor* to improve immune response [23]; significant bruising related to self-administered acupressure for cancer-related fatigue [24]; a high incidence of adverse events including one incidence of anaphylaxis related to the prescription of a phased regimen increasing up to 20mg/kg bodyweight of the isolated phytochemical andrographolide (derived from *Andrographis paniculata*) in a trial which also found improved immune response in people with HIV [25]; abdominal pain, diarrhea and reflux (n=1), and gout (n=2) in a trial of 23 patients taking green-lipped mussel (*Perna canaliculus*) for osteoarthritis or gastrointestinal concerns [26].

Rogue Practitioners

Some of the risks of naturopathic practice have resulted from rogue practitioners practising out of their scope, which in most cases has been dealt with by their naturopathic regulatory authorities but has occasionally extended to the broader court system. For example in *United States v. Feingold* USA courts affirmed the conviction of an Arizona naturopathic physician for unlawful distribution of narcotic (opioid) medications, which naturopathic physicians in that State were specifically prohibited from doing [27]. In *United States v. Livdahl*, USA courts affirmed the conviction of another Arizona naturopath selling unapproved botulinum toxin type A, misrepresenting the product as an FDA-approved drug [28]. Even in jurisdictions where naturopathic practice is permitted, a few practitioners have been found by relevant courts to be placing the public at risk practising outside their scope of practice, by virtue of representing themselves as medical specialists where they did not possess training – for example in the Australian case of

Malaguti v. Orchard where a regulatory appeal prohibiting a naturopath identifying as a medical oncologist without specialist qualifications was upheld [29]. The courts have also dealt with practitioners for unprofessional conduct and professional misconduct. German courts have found naturopaths liable on occasion for failing to warn patients of potential secondary harms caused by treatments – for example blistering that may form on the skin in moxibustion [30] – with failure to communicate these risks being viewed as unprofessional conduct. In the USA case *Bailey v Arkansas* an insanity acquittee with conditional release based on taking prescribed medications, had relapsed resulting in legal action after ceasing such medication based on advice from a naturopathic physician, with the courts highlighting the act as professional misconduct, though no action was taken as the practitioner was not within the jurisdiction of the case [31]. Courts have also dealt with criminal offences by naturopaths. An Australian naturopath was found guilty of multiple counts of sexual assault and rape on patients. Complainants had initially failed to take action due to fraudulent representations as to the medical nature of the sexual act [32].

The presence of rogue naturopaths/naturopathic doctors in the courts needs to be viewed in their context as highly utilized practitioners with a significant primary care role, and the typology of offences is not dissimilar from other health professionals. For example, a Canadian review of health professions charged with criminal negligence related to alleged errors in professional practice found that the instance of naturopaths in such actions compared with other medical and non-medical professions was no more than expected given the size and scope of that profession [33]. Where the negligence of naturopaths/naturopathic doctors has resulted in criminal court actions (e.g. medical manslaughter) [34, 35], this has been largely due to the lack of other regulatory arrangements (naturopaths being an unregistered profession in many countries, with few other avenues for legal recourse available as would be available in other professions) [36, 37], rather than specific or unique factors associated with naturopathic practice or the presence of more rogue practitioners than other health professional groups. Development of appropriate regulatory arrangements for naturopathic practice is likely to improve safety and reduce the number of cases involving naturopaths in court systems.

Deaths Due to Naturopathic Care

Communication breakdowns, diagnostic errors, poor judgment, and inadequate skill can directly result not only in patient harm, but also death, with medical error being a significant cause of death globally in healthcare [38]. Although practised by over 110,000 practitioners globally, deaths arising from naturopathic treatment

errors have been extremely rare. Only nine deaths from naturopathic practice have been publicly reported in the medical and legal literature since 2000. Four of the reported deaths have been due to reactions to intravenous administration of medications.

- In 2003, a 53-year-old woman with no evidence of coronary artery disease, intracranial disease or injury died after treatment in an USA (Oregon) naturopathic clinic after intravenous chelation therapy EDTA to remove heavy metals from the body. The cause of death was determined to be cardiac arrhythmia resulting from hypocalcemia associated with EDTA treatment [39].
- In the Canadian case of *R. v. Javanmardi* the intravenous nutrient injection applied by a Quebec naturopath was found to have been the cause of death for a patient receiving palliative care, though the naturopath was not found to be criminally negligent [40].
- Another USA (California) case report from 2017 details the death of a 31-year old woman from anoxic brain injury secondary to prolonged resuscitation after an adverse reaction to infused *Curcumin* solution provided for allergy treatment in a naturopathic clinic [41].
- Failure to follow established protocols was associated with a patient death in the intravenous application in a Canadian (Ontario) naturopathic clinic of a tissue- and wound-healing formulation including selenium for post-surgical support as part of integrative cancer treatment. The patient had received the formulation without issue on twelve previous occasions, but due to a compounding error arising from documenting “milligrams” instead of “micrograms” had received a fatal overdose [42].

The other causes of death included three from Australia; one due to monopolization of care in cancer treatment, another due to kidney failure from excess heat, hydrotherapy and fasting treatments [36] and the third was the death of a 43-year old naturopathic patient due to dissecting aneurysms of the vertebral arteries following cervical manipulation [43]. A Japanese case report highlights the death of a two-year old infant with acute lymphoblastic leukemia whose prognosis was deemed worsened by the fact that their parents had rejected all conventional cancer treatment and used naturopathic care as a sole alternative [44]. A New Zealand woman died as a result of multi-organ failure due to sepsis secondary to perforation of her rectum sustained while undertaking colonic irrigation performed by a naturopath [45].

Misrepresentation in Naturopathic Care

With the increased interest in natural medicine and the

diversity in naturopathic educational standards and regulation, there are some risks that are unique or more common to naturopathic care including practitioners that co-opt the term “naturopathic”, the presence of unlicensed naturopathic practitioners and the tendency for misleading media.

Co-option of the term “Naturopath”

In jurisdictions where naturopathic practice is unregulated co-option of the term “naturopath” is problematic and exposes the public to risk due to the lack of probity checks and completion of entrance requirements such as minimum standards of training and education. This may mean that practitioners without any naturopathic training or qualifications may identify themselves as a naturopath/naturopathic doctor. For example, an Australian woman was convicted of recklessly causing grievous bodily harm to an infant via prescription of extreme fasting practices that resulted in near-death by starvation [46]. Although widely cited in the community as a naturopath (and her services mistakenly sought in that capacity), the woman had had no formal training in naturopathy or naturopathic medicine [47]. In some cases this has also led to practitioners who have already been identified as problematic in one profession rebranding as a naturopath/naturopathic doctor – another Australian case of *Health Care Complaints Commission v Bao-Queen Nguyen Phuoc* provides an illustrative example, whereby the courts had to take specific action prohibiting an individual practising as a naturopath after they had been de-registered as a conventional medical practitioner for misconduct and had attempted to resume medical practice under the guise of providing naturopathic services [48]. Although this does not present evidence of harm from naturopathic practice, it does place the public seeking naturopathic care at risk, if they cannot be assured that their choice of naturopath/naturopathic doctor is suitably qualified. Although these risks are real, they may be readily ameliorated through proactive regulatory and legislative mechanisms that ensure minimum standards of naturopathic practice and education.

Such co-option also makes it difficult for naturopaths/naturopathic doctors to safely and openly practice and can lead to non-evidence based regulatory actions on naturopathic practice that can be counterproductive. In France, for example, the inter-ministerial agency *Miviludes* has facilitated multiple actions on the naturopathic profession on the assumption that naturopathy is readily co-opted by spiritual and religious movements, rather than the direct actions of naturopaths [49]. This regulatory activity itself has adversely affected naturopathic practice in that country resulting in significant heterogeneity and variability of standards and making it difficult to identify appropriately trained and qualified

practitioners [49]. This differs from the approach taken in other countries such as Slovenia where courts have recognised the development of naturopathic practice standards as reducing the impact of inappropriate practice in that country [50]. In some countries naturopathic practice is expanding more quickly than legislative and regulatory tools. In Chile, for example, it has been held by the courts that naturopathic treatment is a valid option for those rejecting other treatments (e.g. cancer treatments), as well as complement those treatments, but that such treatments must abide by similar codes of conduct as conventional medical practice [51].

Just as appropriate regulations are necessary to minimize the risks of naturopathic practice, inappropriate regulations may increase risks. For example, when German public health officials uncovered high incidences of poor hygiene, lack of essential equipment in practice and poor knowledge of local public health procedures among naturopaths in a large regional city, it was determined that factors excluding naturopaths from receiving updated information on new guidelines was the major factor for these failures, rather than specific actions by the practitioner community [52].

Unlicensed Versus Licensed Naturopathic Practitioners

Patient safety is highly dependent on the regulatory settings within jurisdictions, and the level of training and accountability of practitioners. This is a concern in naturopathic practice, especially in jurisdictions without regulation, as unregulated practitioners appear to have higher risk profiles. For example, although several FDA actions and warning letters against naturopaths/naturopathic doctors for unapproved, misbranded and misleading product or therapy claims in the United States were actioned, most were directed at unlicensed rather than licensed practitioners [53]. Australian analyses of disciplinary data from regulatory authorities for unregistered (including naturopaths) and registered practitioners found that across many categories outlining different issues the proportion of complaints were broadly similar amongst registered and unregistered health practitioners. However, the most significant difference observed – and one observed in naturopathic data – was between ‘professional conduct’ and ‘treatment’ categories, which was thought to be directly related to heterogeneity of standards associated with variable training levels and no enforced training minimums [36].

Misleading Media

Analysis of media discourses around complementary medicine have found that they are often disproportionately critical and can place an undue emphasis upon potential risks [54, 55], or may present limited perspectives [56, 57], with these imbalances increasing [58]. As

such, it is also important to recognize that such sources may not be reliable or representative, highlighting cases of adverse events associated with naturopathic care, but neglecting to provide relevant contextual detail. For example, reporting of the very high-profile death of a Canadian infant from meningitis initially suggested that the parent’s avoidance of necessary emergency care was based on the naturopathic doctor’s advice, while regulatory investigation uncovered that the naturopathic advice had been evidence-informed and that the parents had ignored the naturopathic doctor’s advice to immediately go to the hospital for emergency treatment [59]. A review of Canadian newspaper coverage of naturopathic medicine found that naturopathic medicine coverage tended to be negative, with risks often exaggerated, and in this case often mistakenly suggesting it was the naturopathic doctor who had convinced the parents to avoid emergency care [59]. The potential for biased or incomplete reporting in high-profile media representations highlights the importance for further rigorous, systematic, and objective research in the potential risks and benefits of naturopathic practice, and the regulatory models that best support safe and effective naturopathic care.

Summary

While risks associated with naturopathic practice are relatively rare, they are significant enough that regulatory initiatives aimed at minimizing risks should be encouraged [60]. Although naturopathic practice is not without risk, such risks should be viewed in the context and scope of the benefits of naturopathic practice, which offers significant clinical benefit (see Sections 5 and 6), and with the scope of risks being fairly similar to other professions performing primary health care functions [2, 3]. The results of this chapter also need to be viewed in the context of risks for other health professions. Most of the risks associated with naturopathic practice reported in this chapter are either not unique to naturopathic practice (e.g., adverse events from botanical or intravenous treatments) or are associated with rogue practitioners rather than representative of naturopathic practice (e.g., sexual assault or fraudulent behaviours). The typology of risks of naturopathic practice is broadly similar to what could be expected of any health profession with a substantive primary health care role and are usually substantively less than other practitioner groups performing similar roles.

It should be noted that the adverse events listed in this chapter are not likely to be exhaustive. Many of the articles found during the extensive review process referred not to the peer-review literature, but grey literature (government reports and institutional inquiries), newspaper and magazine news items and court documents as sources of information on risks, which do not lend themselves easily to systematic searches that can be comprehensive and representative. Regulatory decisions

are also not often published or accessible, for registered or unregistered practitioners, as are legal cases. This review also highlights that it would be beneficial to further develop and standardize reporting of adverse events in naturopathic practice.

From this review, it can be concluded that although there are some risks, naturopathic practice when performed by a professional and qualified naturopathic practitioner is safe, and that patient safety in this discipline is highly dependent on the educational standards and

regulatory settings within jurisdictions. Risks associated with naturopathic practice are not inherently unique to problematic aspects of the profession, but rather are commensurate with any profession with the extent and scope of the naturopathic profession in health care. Where risks do exist, most of them can be effectively minimized through the development of appropriate regulations, which should be encouraged as a priority to ensure that the potential benefits of naturopathic medicine are maximized, and any potential harms minimized.

Literature Cited

- Lin, V., McCabe, P., Bensoussan, A., Myers, S., Cohen, M., Hill, S., and Howse, G., *The practice and regulatory requirements of naturopathy and western herbal medicine in Australia*. Risk Management and Healthcare Policy, 2009. 2: p. 21-33.
- Panesar, S.S., deSilva, D., Carson-Stevens, A., Cresswell, K.M., Salvilla, S.A., Slight, S.P., Javad, S., Netuveli, G., Larizgoitia, I., Donaldson, L.J., Bates, D.W., and Sheikh, A., *How safe is primary care? A systematic review*. BMJ Quality & Safety, 2016. 25(7): p. 544-53.
- Nabhan, M., Elraiyah, T., Brown, D.R., Dilling, J., LeBlanc, A., Montori, V.M., Morgenthaler, T., Naessens, J., Prokop, L., Roger, V., Swensen, S., Thompson, R.L., and Murad, M.H., *What is preventable harm in healthcare? A systematic review of definitions*. BMC Health Services Research, 2012. 12: p. 128.
- Wardle, J.L. and Adams, J., *Indirect and non-health risks associated with complementary and alternative medicine use: An integrative review*. European Journal of Integrative Medicine, 2014. 6(4): p. 409-422.
- Hayward, R.A., Asch, S.M., Hogan, M.M., Hofer, T.P., and Kerr, E.A., *Sins of omission: Getting too little medical care may be the greatest threat to patient safety*. Journal of General Internal Medicine, 2005. 20(8): p. 686-91.
- Bensoussan, A., Myers, S.P., Wu, S.M., and O'Connor, K., *Naturopathic and western herbal medicine practice in Australia – a workforce survey*. Complementary Therapies in Medicine, 2004. 12(1): p. 17-27.
- Woods, D.M., Thomas, E.J., Holl, J.L., Weiss, K.B., and Brennan, T.A., *Ambulatory care adverse events and preventable adverse events leading to a hospital admission*. Quality and Safety in Health Care, 2007. 16(2): p. 127-131.
- Endres, H.G., Molsberger, A., Lungenhausen, M., and Trampisch, H.J., *An internal standard for verifying the accuracy of serious adverse event reporting: The example of an acupuncture study of 190,924 patients*. European Journal of Medical Research, 2004. 9(12): p. 545-51.
- Dietz, D.M., Varcelotti, J.R., and Stahlfeld, K.R., *Garlic burns: A not-so-rare complication of a naturopathic remedy?* Burns, 2004. 30(6): p. 612-3.
- Engelhart, S., Saborowski, F., Krakau, M., Scherholz-Schlösser, G., Heyer, I., and Exner, M., *Severe serratia liquefaciens sepsis following vitamin c infusion treatment by a naturopathic practitioner*. Journal of Clinical Microbiology, 2003. 41(8): p. 3986-8.
- Mackinnon, M., *In general practice, 'always expect the unexpected'*. Australian Family Physician, 2008. 37(4): p. 235-6.
- Chan, C.K., Chan, M.H., Tse, M.L., Chan, I.H., Cheung, R.C., Lam, C.W., and Lau, F.L., *Life-threatening torsades de pointes resulting from "natural" cancer treatment*. Clinical Toxicology, 2009. 47(6): p. 592-4.
- Linder, S.A., Mele, J.A., 3rd, and Harries, T., *Chronic hyperpigmentation from a heated mustard compress burn: A case report*. Journal of Burn Care & Rehabilitation, 1996. 17(4): p. 351-2.
- Newey, C.R., Sarwal, A., and Tepper, D., *Iatrogenic venous thrombosis secondary to supplemental medicine toxicity*. Journal of Complementary and Integrative Medicine, 2013. 10.
- Oliver, M.R., Van Voorhis, W.C., Boeckh, M., Mattson, D., and Bowden, R.A., *Hepatic mucormycosis in a bone marrow transplant recipient who ingested naturopathic medicine*. Clinical Infectious Diseases, 1996. 22(3): p. 521-4.
- Pitre, T., Mah, J., Vertes, J., Rebello, R., and Zhu, J., *Drug induced hepatitis mimicking wilson's disease secondary to the use of complex naturopathic regimens: A case report*. BMC Gastroenterology, 2019. 19(1): p. 199.
- Sasagawa, M., Cornell, J.L., Flood, H.A., and Amieux, P.S., *Evaluation of case report publications on naturopathic medicine*. Journal of Restorative Medicine, 2017. 6(1): p. 77-86.
- Wardle, J. and Roseen, E., *Integrative medicine case reports: A clinicians' guide to publication*. Advances in Integrative Medicine, 2014. 1(3): p. 144-147.
- Myers, S.P. and Vigar, V., *The state of the evidence for whole-system, multi-modality naturopathic medicine: A systematic scoping review*. Journal of Alternative and Complementary Medicine, 2019. 25(2): p. 141-168.
- Hershman, D.L., Unger, J.M., Crew, K.D., Minasian, L.M., Awad, D., Moinpour, C.M., Hansen, L., Lew, D.L.,

- Greenlee, H., and Fehrenbacher, L., *Randomized double-blind placebo-controlled trial of acetyl-L-carnitine for the prevention of taxane-induced neuropathy in women undergoing adjuvant breast cancer therapy*. Journal of Clinical Oncology, 2013. **31**(20): p. 2627-2633.
21. Hershman, D.L., Unger, J.M., Crew, K.D., Till, C., Greenlee, H., Minasian, L.M., Moynour, C.M., Lew, D.L., Fehrenbacher, L., and Wade III, J.L., *Two-year trends of taxane-induced neuropathy in women enrolled in a randomized trial of acetyl-L-carnitine (swog s0715)*. Journal of the National Cancer Institute, 2018. **110**(6): p. 669-76.
 22. Zick, S.M., Gillespie, B., and Aaronson, K.D., *The effect of crataegus oxyantha special extract ws 1442 on clinical progression in patients with mild to moderate symptoms of heart failure*. European Journal of Heart Failure, 2008. **10**(6): p. 587-93.
 23. Torkelson, C.J., Sweet, E., Martzen, M.R., Sasagawa, M., Wenner, C.A., Gay, J., Putiri, A., and Standish, L.J., *Phase 1 clinical trial of trametes versicolor in women with breast cancer*. ISRN Oncology, 2012. **2012**: p. 1-7.
 24. Zick, S.M., Sen, A., Wyatt, G.K., Murphy, S.L., Arnedt, J.T., and Harris, R.E., *Investigation of 2 types of self-administered acupressure for persistent cancer-related fatigue in breast cancer survivors: A randomized clinical trial*. JAMA Oncology, 2016. **2**(11): p. 1470-6.
 25. Calabrese, C., Berman, S.H., Babish, J.G., Ma, X., Shinto, L., Dorr, M., Wells, K., Wenner, C.A., and Standish, L.J., *A phase I trial of andrographolide in HIV positive patients and normal volunteers*. Phytotherapy Research, 2000. **14**(5): p. 333-8.
 26. Coulson, S., Vecchio, P., Gramotnev, H., and Vitetta, L., *Green-lipped mussel (perna canaliculus) extract efficacy in knee osteoarthritis and improvement in gastrointestinal dysfunction: A pilot study*. Inflammopharmacology, 2012. **20**(2): p. 71-76.
 27. LoPuzzo, B., *A bitter pill to swallow: The need for a clearly-defined course of professional practice when prescribing opioids for the legitimate medical purpose of treating pain*. Hofstra Law Review, 2018. **47**: p. 1397.
 28. Barnes, M.C. and Worthy, S.L., *Applying lessons from the opioid abuse epidemic to protect consumers from gray market biologics*. Notre Dame Journal of Law, Ethics & Public Policy, 2015. **29**: p. 375.
 29. *Malaguti v Orchard [2020] QDC 242*.
 30. *Judgment of the regional court in Bonn (landgericht bonn) 9 O 234/14 of 19 June 2015*.
 31. *Case law developments*. Mental & Physical Disability Law Reporter, 2003. **27**(2): p. 233-238.
 32. Crowe, J. and Sveinsson, L., *Intimidation, consent and the role of holistic judgments in an Australian rape law*. University of Western Australia Law Review, 2017. **42**: p. 136-153.
 33. McDonald, F., *The criminalisation of medical mistakes in Canada: A review*. Health Law Journal, 2008. **16**: p. 1-25.
 34. Tuckett, N., *Balancing public health and practitioner accountability in cases of medical manslaughter: Reconsidering the tests for criminal negligence-related offences in Australia after R v Patel*. Journal of Law and Medicine, 2011. **19**(2): p. 377-96.
 35. Dobinson, I., *Medical manslaughter*. University of Queensland Law Journal, 2009. **28**: p. 101.
 36. Wardle, J., *Holding unregistered health practitioners to account: An analysis of current regulatory and legislative approaches*. Journal of Law and Medicine, 2014. **22**(2): p. 350-75.
 37. Carter, D.J., *Correcting the record: Australian prosecutions for manslaughter in the medical context*. Journal of Law and Medicine, 2015. **22**(3): p. 588-609.
 38. Makary, M.A. and Daniel, M., *Medical error – the third leading cause of death in the US*. British Medical Journal, 2016. **353**: p. i2139.
 39. Brown, M.J., Willis, T., Omalu, B., and Leiker, R., *Deaths resulting from hypocalcemia after administration of edetate disodium: 2003 – 2005*. Pediatrics, 2006. **118**(2): p. e534-e536.
 40. *R. V. Javanmardi, 2019 SCC 54*.
 41. Lasoff, D.R., Cantrell, F.L., and Ly, B.T., *Death associated with intravenous turmeric (curcumin) preparation*. Clinical Toxicology, 2018. **56**(5): p. 384-385.
 42. Institute for Safe Medication Practices Canada, *Death associated with an iv compounding error and management of care in a naturopathic centre*. ISMP Canada Safety Bulletin, 2018. **18**(1): p. 1-5.
 43. Dunne, J.W., Conacher, G.N., Khangure, M., and Harper, C.G., *Dissecting aneurysms of the vertebral arteries following cervical manipulation: A case report*. Journal of Neurology, Neurosurgery, and Psychiatry, 1987. **50**(3): p. 349-53.
 44. Usumoto, Y., Sameshima, N., Tsuji, A., Kudo, K., Nishida, N., and Ikeda, N., *Medical neglect death due to acute lymphoblastic leukaemia: An autopsy case report*. Fukuoka Igaku Zasshi, 2014. **105**(12): p. 234-40.
 45. *Platt [2009] NZCORC 32 (6 May 2009)*.
 46. *Bodnar v Health Care Complaints Commission [2019] NSWCATOD 188 (13 December 2019)*.
 47. Ooi, S.L., McLean, L., and Pak, S.C., *Naturopathy in Australia: Where are we now? Where are we heading?* Complementary Therapies in Clinical Practice, 2018. **33**: p. 27-35.
 48. *Health Care Complaints Commission v Bao-Quy Nguyen-Phuoc (no. 2) [2015] NSWCATOD 94 (14 September 2015)*.
 49. Grisoni, A., *De la naturopathie rurale à la santé naturelle: Distanciation et assimilation autour de la notion d'espace*. Nouvelles Perspectives en Sciences Sociales, 2012. **8**(1): p. 237-259.
 50. Sajovic, S., *Odškodninska odgovornost zdravilcev [fort liability of healers]*. Pravnik: Revija za Pravno Teorijo in Prakso, 2018. **135**(11-12): p. 823-858.
 51. Vivanco Martínez, Á., *Negativa de un menor de edad y de su familia a que este reciba una terapia desproporcionada o con pocas garantías de efectividad: Apelación de medida de protección otorgada por la jueza de familia de valdivia. Sentencia de la i. Corte de apelaciones de valdivia, de 14 de mayo de 2009*. Revista Chilena de Derecho, 2009. **36**(2): p. 399-440.
 52. Heudorf, U., Carstens, A., and Exner, M., *[naturopathic practitioners and the public health system. Legal principles as well as experience from naturopathic practitioner candidate tests and hygiene inspections of naturopathic practitioner's practices in the rhine-main area in 2004 – 2007]*.

- Bundesgesundheitsblatt Gesundheitsforschung Gesundheitsschutz, 2010. 53(2): p. 245-57.
53. Marzen, C.G. and Conklin, M., *Coronavirus 'cures' and the courts*. William and Mary Business Law Review, 2020. 12(1): p. 1-22.
54. Lewis, M., *Risk and efficacy in biomedical media representations of herbal medicine and complementary and alternative medicine (cam)*. Journal of Evidence-Based Complementary & Alternative Medicine, 2011. 16(3): p. 210-217.
55. Lewis, M., *CAM products, practitioners, and the state – Perspectives on 'risk' and 'protection of the public' in the Australian media*. Gale N and McHale J (eds) Routledge Handbook of Complementary and Alternative Medicine. Routledge: London, 2015.
56. Lewis, M., *Political citizens, consumers, or passive patients? Imagined audiences in the complementary medicine debate*. Communication Research and Practice, 2020. 6(3): p. 209-228.
57. Lewis, M., *De-legitimising complementary medicine: Framings of the friends of science in medicine – CAM debate in Australian media reports*. Sociology of Health & Illness, 2019. 41(5): p. 831-851.
58. Lopera-Pareja, E.H. and Cano-Orón, L., *Media's portrayal of CAM: Exploring 40 years of narratives and meanings in public discourse*. Journalism. 0(0): p. 1464884920985407.
59. Snow, D., *The social construction of naturopathic medicine in Canadian newspapers*. Policy Studies, 2019: p. 1-21.
60. Carè, J., Steel, A., and Wardle, J., *Stakeholder attitudes to the regulation of traditional and complementary medicine professions: A systematic review*. Human Resources for Health, 2021. 19(1): p. 42.

8

Economics of Naturopathic Care

Jon Wardle, ND PhD

HIGHLIGHTS

- Research indicates that naturopathic care is cost-effective when applied in appropriate circumstances.
- The preventive focus of naturopathic care addresses many modifiable risk factors – lifestyle behaviours, physical activity, sedentariness, obesity, alcohol consumption, dietary choices, and environmental exposures – associated with the increased cost of noncommunicable diseases.
- Additional studies are required to confirm and quantify the cost-effectiveness of naturopathic care across a broad range of conditions.

There are relatively few studies examining the economics of traditional, complementary, and integrative medicine and most of the studies investigating the economics of naturopathic practice have not focused on whole-practice naturopathic care, but instead have focused on the cost-effectiveness of specific therapies. Economic analyses exploring cost-effectiveness have recently been undertaken on specific individual therapies and practices employed by naturopaths/naturopathic doctors – including physical manipulation, acupuncture, nutritional and herbal medicines. These studies have found that naturopathic care is cost-effective when applied in appropriate circumstances [1]. Many of those individual therapies were found to be cost-effective (for example, St John's wort in treatment of mild to moderate depression [2], nutritional supplement regimes in post-surgical patients [3], manual therapies for multiple musculoskeletal disorders [4] or hydrotherapy treatments in Parkinson's disease [5]) and are commonly applied in naturopathic practice globally [6]. The transferability of such research is supported by the fact that the naturopathic community has taken a leadership role in evaluating the cost-effectiveness of individual complementary and conventional therapies even outside of naturopathic settings [7-10].

The focus of naturopathic care on holistic prevention and long-term outcomes aligns with approaches to care that are known to be cost-effective [11]. For example, in addition to the therapies themselves, the empowering naturopathic approach to treatment, especially the focus on *Docere* or doctor as teacher, supports and empowers persons with chronic conditions and helps them to perform self-care that improves their well-being, decreases morbidity and mortality and reduces health costs [12].

Overview of Studies

Three economic evaluations of naturopathic practice have been conducted that highlight the clinically and cost-effective application of whole-practice naturopathic treatment in a variety of settings from both a payer and patient perspective [13-15]. These studies are summarized in Table 8.1.

The incorporation of economic analyses into trials of naturopathic interventions can be challenging and may account for the current scarcity of trials. One trial of naturopathic care for anxiety, for example, reported including a cost-effectiveness analysis in its initial study design, but it could not proceed as fewer than half of study participants were willing to consent to the researchers being able to access additional medical records [16]. Another reason for such paucity is that many naturopathic researchers may conduct economic analyses of individual therapies rather than naturopathic care, a problem known to down-play the prevalence of naturopathic research in other areas [17]. For example, naturopathic researchers have led economic evaluations confirming the cost-effectiveness of Horsechestnut (*Aesculus hippocastanum*) for venous leg ulcers [7], mindfulness and cognitive behavioural therapy in low back pain [9] and generic integration of complementary therapies in hospital settings [8], but their link to naturopathic practice had not been made explicit in these studies. Due to the paucity of naturopathic-specific data, several researchers have attempted to examine the economic impact of naturopathic services in other ways, often using secondary data. A study of the USA National Health Interview Survey data examined the impact of accessing various complementary medicine services on work absenteeism. The study used propensity

score matching, a statistical matching technique that attempts to estimate the effect of a treatment, policy, or other intervention by accounting for the covariates that predict receiving the treatment. In the sample of 8,820 workers, the average number of workdays lost due to illness was 3.69. Visiting a naturopathic practitioner correlated with 2.359 and 2.521 fewer workdays lost due to illness for women and men, respectively [18].

Current Funding Models for Naturopathic Care

Naturopathic care globally is primarily covered by third party insurers or out-of-pocket costs borne by consumers, rather than by government-funded programs [19]. To date there has been relatively little integration of naturopathy/naturopathic medicine into public health or universal health care systems. Some jurisdictions – such as Switzerland and several US States – mandate the inclusion of naturopathy/naturopathic medicine in some insurance plans [19, 20]. However, even in countries where naturopathic treatment is included in public health systems – such as India – delivery and use remains higher in the private sector [21]. Integration of naturopathy/naturopathic medicine into health systems has been inconsistent. In countries that have allowed for funding for naturopathic services to occur, this is often only in limited circumstances. For example, long-standing legislative arrangement mean that in some German jurisdictions naturopaths are able to perform publicly subsidized primary health care services in rural areas if conventional primary health care services are not available [22], and in Australia naturopathic services are reimbursable in government workers' compensation schemes if directly referred by a medical practitioner [23]. Where naturopathy/naturopathic medicine has been approved as an intervention eligible for funding, decision-making may be decentralized and uptake ad-hoc and inconsistent. For example, although naturopathy/naturopathic medicine was included in the Brazilian national health system in 2017, relatively few local authorities have offered this service [24], and while naturopathic physicians are recognized as eligible providers in health services overseen by the US *Indian Health Service and Department of Veterans Affairs* their integration into these services remains variable [19]. While some third-party insurers have attempted to measure the economic impact of integration of naturopathy/naturopathic care into their programs, and are discussed below, there have not been formal attempts to measure the economic and systems impacts of integration of naturopathic care into public health systems. Clinical research evidence for several health conditions supports naturopathic integration into public health systems at a greater level than currently exists, but further integration of naturopathic care should be complemented with economic analyses to determine the cost-effectiveness and systems impacts of such integration.

Economic Impact on Health Insurers

Insurance reimbursement for naturopathic services tends to be fee-for-service based, rather than linked to specific conditions or interventions, making detailed economic analyses challenging. However, insurers have examined the economic impact of inclusion of naturopathic or other traditional, complementary, and integrative medicine services into their coverage. A USA (Washington) cost minimization study of insurance data for 39,491 people with three conditions (back pain, menopause, and fibromyalgia) matched for age, gender, total disease burden, found that the insurance expenditures in prior year for users of complementary medicine services (which included naturopathy as a major component) had \$356 lower annual expenditure than those that did not use those services. Interestingly the results differed by disease burden; people with lower disease burden used more services and spent more total dollars yet use of complementary approaches in people with higher disease burden was associated with much reduced use of services, resulting in higher economic benefits [25].

Although reimbursement of naturopathic services in insurance programs does appear to increase naturopathic utilization [26], economic impost on insurers has been limited, with USA data indicating naturopathic care typically comprises less than 1% of total insurer payments even if fully incorporated as full-scope primary care practitioners [27, 28]. USA (Washington) insurance data suggest that incorporation into insurance programs is usually more cost-effective than modelled (as models are based on conventional medical care data), even with high use, and results in high satisfaction [29]. USA (Vermont) data has shown considerable cost savings from inclusion of naturopathic care as part of standard treatment, related primarily to reduced risk factors for chronic disease [15]. Three year data analysis from an Australian insurer found that rather than increasing cost per patient, incorporation of complementary medicines (which included naturopathy as its largest item by claims) reduced the average hospital costs of members by between \$200 (standard coverage) to \$430 (top ancillary cover) per year, though it was not known whether this effect was related to reduced health costs, or attraction of healthier member cohorts, as the change was also associated with a 55% rise in membership over 3 years [30].

Table 8.1: Economic studies investigating naturopathic practice

Study Title	Country, Year	Methods	Outcomes
A naturopathic approach to the prevention of cardiovascular disease: cost-effectiveness analysis of a pragmatic multi-worksites randomized clinical trial [13]	Canada, 2010	Economic evaluation alongside a pragmatic, multi-worksites, randomized controlled trial comparing enhanced usual care (usual care plus biometric screening) (n=122) compared to enhanced usual care with the addition of a naturopathic approach to cardiovascular disease prevention (n=124). Naturopathic care consisted of individualised lifestyle counselling, nutritional and botanical prescriptions.	Direct medical costs of naturopathic care were more expensive (\$302 per participant) than biomedical screening alone, but less expensive than comparable medical pharmaceutical costs (\$347-818 per participant). The addition of naturopathic care to enhanced usual care resulted in a net decrease of 3.3 (confidence interval: 1.7 to 4.8) percentage points in 10-year cardiovascular event risk (number needed to treat = 30). These risk reductions came with average net study-year savings of \$1138 in societal costs and \$1187 in employer costs. There was no change in quality-adjusted life years across the study year
Cost-effectiveness of naturopathic care for chronic low back pain [14]	Canada, 2006	Naturopathic therapy (n=39) vs. Physical therapy (n=36) for low back pain 3-month, once weekly, 30-minute visits. Naturopathic treatment included exercise, diet, relaxation training, acupuncture	Initial costs for naturopathic treatment were higher (\$1469 vs. \$337) Absenteeism estimates in naturopathic group saved 4.8 days (\$817), compared to physical therapy group which lost 1.9 days or (\$324) Other costs reduced by \$840 in naturopathic group, including visits to chiropractors, massage, other physical therapists. Physical therapy group had increases in all these healthcare costs (\$363) Minor difference between groups in pain medication use Naturopathic group – \$188 total benefit vs. Physical therapy Group \$1212 total cost If excluding absenteeism, naturopaths cost \$629, physical therapists cost \$700 Naturopathic QALY – 0.0293; Physical therapy QALY – 0.0036 (one-tenth of that created by naturopathic care)
Vermont Car Dealers Help to Quantify the Benefits of Naturopathic Care [15]	USA, 2006	Analysis of impact of the Vermont Automobile Dealers Association (VADA) expanding insurance coverage to include naturopathic care to its 1182 members.	VADA realized direct cost savings of US\$315 817 (US\$267.22 per person) and indirect cost savings of US\$1 143 657 (US\$967.56 per person) in the first year from users of naturopathic medicine, predominantly due to a 36% reduction in hypertension; a 17% reduction in hypercholesterolemia; and a 15% reduction in obesity.

Evaluation of Naturopathic Costs of Care

Some superficial assessment of costs of naturopathic treatment have also been conducted which have assessed cost of treatment, as opposed to *cost-effectiveness* of treatment. Data, from Germany for example, indicate that costs for naturopathic inpatient treatment in hospitals is higher than costs for conventional treatment of similar diagnosis-related billing group codes [31]. These are thought to be primarily related to the longer duration of patient stays, and associated nursing costs from increased patient-centred and educative care practices, and

long-term cost impacts remain unknown [32]. However, in some settings, particularly musculoskeletal care, German insurance analyses indicate decreased institution-level costs have been shown for naturopathic inpatient care when compared to conventional orthopaedic comparators [33]. Such results need to be viewed in the context of improved long-term treatment outcomes from inpatient naturopathic care – which has a focus on delivering long-term and sustained improvements in health outcomes – when compared with naturopathic care [34, 35]. Future economic studies should consider the long-term as well as short-term economic impacts of naturopathic care to ensure that analyses are reflective of naturopathic practice.

Summary

The few economic evaluations of naturopathic interventions that have been conducted have reliably shown naturopathic care to be cost-effective, particularly for longer-term and chronic outcomes, and for persons with higher disease burden. Although naturopathic care can be initially more expensive in some instances, its focus on long-term outcomes and prevention can make it cost-effective in the long run. Studies also suggest societal economic benefits from naturopathic care, such as improved presenteeism and reduced absenteeism, and lower overall insurance costs per person. Integration of

complementary therapies in multidisciplinary settings has also shown the ability to reduce costs of care while delivering equal or better clinical outcomes in general inpatient populations [8], oncology patients [36] and pain patients [37], and such findings are suggestive of a potentially beneficial role for naturopaths/naturopathic doctors in integrative multidisciplinary settings. Further, more rigorous studies are required to confirm the cost-effectiveness of naturopathic care in a variety of clinical settings, but all available data currently point to naturopathic care being a cost-effective health care intervention.

Literature Cited

- Herman, P.M., Poindexter, B.L., Witt, C.M., and Eisenberg, D.M., *Are complementary therapies and integrative care cost-effective? A systematic review of economic evaluations*. *BMJ Open*, 2012. **2**(5): p. e001046.
- Solomon, D., Adams, J., and Graves, N., *Economic evaluation of St. John's wort (Hypericum perforatum) for the treatment of mild to moderate depression*. *Journal of Affective Disorders*, 2013. **148**(2-3): p. 228-34.
- Smedley, F., Bowling, T., James, M., Stokes, E., Goodger, C., O'Connor, O., Oldale, C., Jones, P., and Silk, D., *Randomized clinical trial of the effects of preoperative and postoperative oral nutritional supplements on clinical course and cost of care*. *British Journal of Surgery*, 2004. **91**(8): p. 983-90.
- Tsertsvadze, A., Clar, C., Court, R., Clarke, A., Mistry, H., and Sutcliffe, P., *Cost-effectiveness of manual therapy for the management of musculoskeletal conditions: a systematic review and narrative synthesis of evidence from randomized controlled trials*. *Journal of Manipulative and Physiological Therapeutics*, 2014. **37**(6): p. 343-62.
- Brefel-Courbon, C., Desboeuf, K., Thalamas, C., Galitzky, M., Senard, J.M., Rascol, O., and Montastruc, J.L., *Clinical and economic analysis of spa therapy in Parkinson's disease*. *Movement Disorders*, 2003. **18**(5): p. 578-84.
- Steel, A., Foley, H., Bradley, R., Van De Venter, C., Lloyd, I., Schloss, J., Wardle, J., and Reid, R., *Overview of international naturopathic practice and patient characteristics: results from a cross-sectional study in 14 countries*. *BMC Complementary Medicine and Therapies*, 2020. **20**(1): p. 59.
- Leach, M.J., Pincombe, J., and Foster, G., *Using horsechestnut seed extract in the treatment of venous leg ulcers: a cost-benefit analysis*. *Ostomy Wound Manage*, 2006. **52**(4): p. 68-70, 72-4, 76-8.
- Ostermann, T., Lauche, R., Cramer, H., and Dobos, G., *Comparative cost analysis of inpatient integrative medicine – Results of a pilot study*. *Complementary Therapies and Medicine*, 2017. **32**: p. 129-133.
- Herman, P.M., Anderson, M.L., Sherman, K.J., Balderson, B.H., Turner, J.A., and Cherkin, D.C., *Cost-effectiveness of Mindfulness-based Stress Reduction Versus Cognitive Behavioral Therapy or Usual Care Among Adults With Chronic Low Back Pain*. *Spine (Phila Pa 1976)*, 2017. **42**(20): p. 1511-1520.
- Steel, A., Sundberg, T., Reid, R., Ward, L., Bishop, F.L., Leach, M., Cramer, H., Wardle, J., and Adams, J., *Osteopathic manipulative treatment: A systematic review and critical appraisal of comparative effectiveness and health economics research*. *Musculoskeletal Science & Practice*, 2017. **27**: p. 165-175.
- Bradley, R., Harnett, J., Cooley, K., McIntyre, E., Goldenberg, J., and Adams, J., *Naturopathy as a Model of Prevention-Oriented, Patient-Centered Primary Care: A Disruptive Innovation in Health Care*. *Medicina (Kaunas)*, 2019. **55**(9).
- Riegel, B., Dunbar, S.B., Fitzsimons, D., Freedland, K.E., Lee, C.S., Middleton, S., Stromberg, A., Vellone, E., Webber, D.E., and Jaarsma, T., *Self-care research: Where are we now? Where are we going?* *International Journal of Nursing Studies*, 2021. **116**: p. 103402.
- Herman, P.M., Szczerko, O., Cooley, K., and Seely, D., *A naturopathic approach to the prevention of cardiovascular disease: cost-effectiveness analysis of a pragmatic multi-worksites randomized clinical trial*. *Journal of Occupational and Environmental Medicine*, 2014. **56**(2): p. 171.
- Herman, P.M., Szczerko, O., Cooley, K., and Mills, E.J., *Cost-effectiveness of naturopathic care for chronic low back pain*. *Alternative Therapies in Health & Medicine*, 2008. **14**(2).
- Noe, B. *Vermont Car Dealers Help to Quantify the Benefits of Naturopathic Care*. in *21st Annual Conference of the American Association of Naturopathic Physicians*. 2006. Potland.
- Cooley, K., Szczerko, O., Perri, D., Mills, E.J., Bernhardt, B., Zhou, Q., and Seely, D., *Naturopathic care for anxiety: a randomized controlled trial ISRCTN78958974*. *PLoS One*, 2009. **4**(8): p. e6628.
- Steel, A., Bradley, R., and Wardle, J., *Naturopathic Research: Prevalent, Relevant, But Largely Hidden in Plain*

- Sight*. Journal of Alternative and Complementary Medicine, 2019. 25(2): p. 123-124.
18. Rybczynski, K., *Alternative medicine, worker health, and absenteeism in the United States*. Complementary Therapies in Medicine, 2017. 32: p. 116-128.
 19. Wardle, J. and Adams, J., *Naturopaths: their role in primary health care delivery, in Primary Health Care and Complementary and Integrative Medicine: Practice and Research*. 2013, World Scientific. p. 73-92.
 20. Barth, J., Maier, S., Lebet, F., King, R., Abersfelder, A., Bachmann, R., Keberle, S., and Witt, C.M., *What is offered and treated by non-medical complementary therapists in Switzerland: Results from a national web survey*. European Journal of Integrative Medicine, 2020. 36: p. 101109.
 21. Rudra, S., Kalra, A., Kumar, A., and Joe, W., *Utilization of alternative systems of medicine as health care services in India: Evidence on AYUSH care from NSS 2014*. PLoS One, 2017. 12(5): p. e0176916.
 22. Bodeker, G. and Burford, G., *Traditional, Complementary and Alternative Medicine: Policy and Public Health Perspectives*. 2007, London: Imperial College Press. xvii, 453 p.
 23. Worksafe Victoria, *Naturopathy Services Policy*. 2021, Worksafe Victoria: Melbourne.
 24. Habimorad, P.H.L., Catarucci, F.M., Bruno, V.H.T., Silva, I.B.D., Fernandes, V.C., Demarzo, M.M.P., Spagnuolo, R.S., and Patricio, K.P., *Implementation of Brazil's National Policy on Complementary and Integrative Practices: strengths and weaknesses*. Cien Saude Colet, 2020. 25(2): p. 395-405.
 25. Lind, B.K., Lafferty, W.E., Tyree, P.T., and Diehr, P.K., *Comparison of health care expenditures among insured users and nonusers of complementary and alternative medicine in Washington State: a cost minimization analysis*. Journal of Alternative and Complementary Medicine, 2010. 16(4): p. 411-7.
 26. Lafferty, W.E., Bellas, A., Corage Baden, A., Tyree, P.T., Standish, L.J., and Patterson, R., *The use of complementary and alternative medical providers by insured cancer patients in Washington State*. Cancer, 2004. 100(7): p. 1522-30.
 27. Lafferty, W.E., Tyree, P.T., Bellas, A.S., Watts, C.A., Lind, B.K., Sherman, K.J., Cherkin, D.C., and Grembowski, D.E., *Insurance coverage and subsequent utilization of complementary and alternative medicine providers*. American Journal of Managed Care, 2006. 12(7): p. 397-404.
 28. Bellas, A., Lafferty, W.E., Lind, B., and Tyree, P.T., *Frequency, predictors, and expenditures for pediatric insurance claims for complementary and alternative medical professionals in Washington State*. Archives of Pediatrics & Adolescent Medicine, 2005. 159(4): p. 367-72.
 29. Stewart, D., Weeks, J., and Bent, S., *Utilization, patient satisfaction, and cost implications of acupuncture, massage, and naturopathic medicine offered as covered health benefits: a comparison of two delivery models*. Alternative Therapies in Health and Medicine, 2001. 7(4): p. 66-70.
 30. Wardle, J., *The Australian government review of natural therapies for private health insurance rebates: what does it say and what does it mean?* Advances in Integrative Medicine, 2016. 3(1): p. 3-10.
 31. Romeyke, T. and Stummer, H., *A study of costs and length of stay of inpatient naturopathy – evidence from Germany*. Complementary Therapies in Clinical Practice, 2011. 17(2): p. 90-5.
 32. Romeyke, T. and Stummer, H., *Economic aspects of nursing in inpatient naturopathy: Evidence from Germany*. Nursing Economics, 2013. 31(3): p. 137-43.
 33. Wiebelitz, K.R., Teske, W., Henke, T., Knobloch, R., Winnemöller, C., and Beer, A.M., *[Comparison of treatment expenses of naturopathic and orthopedic in-patient treatment]*. MMW Fortschr Med, 2010. 151 Suppl 4: p. 159-68.
 34. Beer, A.M., Ostermann, T., and Matthiessen, P.F., *[Changes in quality of life during acute inpatient naturopathic treatment – results of the Blankenstein model]*. Gesundheitswesen, 2001. 63(4): p. 242-7.
 35. Ostermann, T., Beer, A.M., and Matthiessen, P.F., *[Evaluation of inpatient naturopathic treatment—the Blankenstein model. Part II: Effective strength and health status of patients over the course of time]*. Forsch Komplementarmed Klass Naturheilkd, 2002. 9(5): p. 269-76.
 36. Tillery, R. and McGrady, M.E., *Do complementary and integrative medicine therapies reduce healthcare utilization among oncology patients? A systematic review of the literature and recommendations*. European Journal of Oncology Nursing, 2018. 36: p. 1-8.
 37. Mahrer, N.E., Gold, J.I., Luu, M., and Herman, P.M., *A Cost-Analysis of an Interdisciplinary Pediatric Chronic Pain Clinic*. Journal of Pain, 2018. 19(2): p. 158-165.

9 International Survey of Naturopathic Patients and Practices

Amie Steel, ND PhD
Hope Foley, ND PhD
Ryan Bradley, ND

Claudine Van De Venter, ND
Iva Lloyd, ND
Janet Schloss, ND PhD

Jon Wardle, ND PhD
Rebecca Redmond, ND

HIGHLIGHTS

- Naturopaths/NDs practice as primary care providers and work collaboratively with other healthcare professionals.
- Naturopaths/NDs provide health care for diverse chronic and acute health conditions throughout all stages of life and support patients seeking preventive and/or palliative care.
- Three out of four patients seek naturopathic care to address non-communicable diseases.
- Naturopaths/NDs are an untapped health resource for governments to address high burden health conditions in the community.
- Naturopaths/NDs use an average of four or more therapeutic modalities or practices with each patient; the most common are *applied nutrition*, *lifestyle modifications*, *herbal medicines*, and *clinical nutrition*.

The World Naturopathic Federation (WNF) undertook an international cross-sectional survey in 2019 with the aim to describe the characteristics of typical naturopathic practices throughout the world and the characteristic of the patients accessing those services [1, 2]. This chapter presents an excerpt from that paper titled “*Overview of international naturopathic practice and patient characteristics: results from a cross-sectional study in 14 countries*” that was published in BMC Complementary Medicine and Therapies in 2020 [1]. The study included data from 56 naturopathic clinics in 14 countries within four WHO Regions including Europe (Portugal, Spain, Switzerland and the United Kingdom), the Americas (Brazil, Canada, Chile and the United States), the Western Pacific (Australia, Hong Kong, and New Zealand) and Africa (South Africa) and was administered in four languages – English, French, Portuguese and Spanish [1].

Implications

This international naturopathic practice survey presents the first known examination of international naturopathic practice. It supported the results received from previous WNF surveys of the profession [3, 4] and it provided key findings with particular importance for the understanding of naturopathy/naturopathic medicine in the context of contemporary healthcare practice and policy.

Naturopathic Practice as Primary Care

Significantly, in all geographic settings included in the study, naturopaths/naturopathic doctors appear to treat patients with a diverse range of conditions and across all ages and populations. The survey results indicate a balance between naturopaths/naturopathic doctors practicing as primary care providers and delivering care to patients without the involvement of other health professionals, and with them working collaboratively with other healthcare professionals. These characteristics highlight the versatility of naturopathic practice as the naturopathic workforces aligns with the established definition of primary care in that it “addresses any health problem at any stage of a patient’s life cycle” [5]. The patient conditions reported in the survey not only demonstrate diversity, but also include conditions recognized as contributing significantly to the global burden of disease; i.e., four out of the five global leading causes of disability (low back pain, depressive disorders, headache and diabetes) were among those reported by participants as the primary reason of their patient’s visit (see Figure 9.1) [6]. Furthermore, nine of the ten leading causes of early death in 2040 are featured in the list of conditions for which patients were described as seeking treatment from a naturopath/naturopathic doctor [7]. Given the

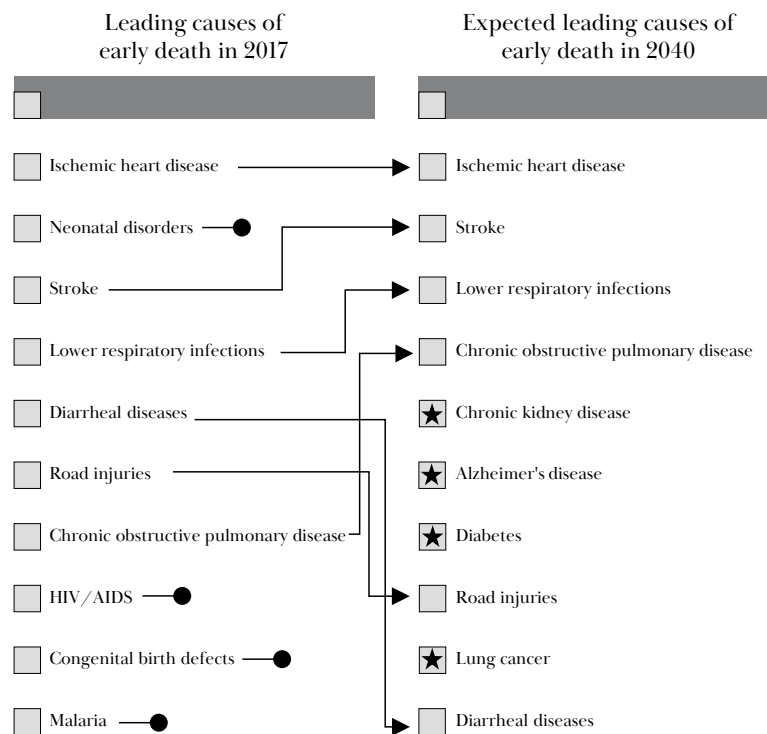


Figure 9.1: Changes between leading causes of early death in 2017 and expected leading causes of early death in 2040 (Source: Global Burden of Disease Study, 2017)[8] ★ = leading cause of early death 2021

priority placed on finding healthcare solutions to the challenges these conditions present to the global population, the contribution of naturopaths/naturopathic doctors should be considered.

Naturopathic Practice features Dietary and Lifestyle Prescription

Many of these conditions identified as being treated by naturopaths/naturopathic doctors are noncommunicable diseases (NCDs) with high quality established evidence for responding to preventive care and health promotion counselling to reduce established risk factors [9]. A prominent feature for the majority of the NCDs is the importance of diet and lifestyle factors as evidence-based primary prevention, particularly for cardiovascular disease [6, 9], diabetes [10], lung cancer [11], chronic kidney disease [12], and chronic obstructive pulmonary disease [13], with emerging evidence for Alzheimer's disease [14] and lower respiratory tract infections [15]. Interestingly for the latter, prevention of lower respiratory tract infections has been linked to various factors including improved sleep, dietary modifications, improved immune function and psychological support, suggesting that a holistic approach to clinical care is required [15]. The research presented in Section 5 of this Health Technology Assessment further supports

the potential contribution of naturopaths/naturopathic doctors in supporting patients with these economically, socially, and individually important health conditions.

Naturopathy as a Holistic Practice

Holism is integral to naturopathic philosophy and preventive care is reflected in the core naturopathic principle of *Health Promotion and Disease Prevention* [16]. While primary prevention is a global priority for the health conditions causing early death and disability, it is also worth noting that primary care medical practitioners may be challenged to accommodate preventive health care service delivery within their usual care load [17]. As such, naturopaths/naturopathic doctors may be an untapped health resource in many healthcare systems which can relieve the burden on primary care medical physicians [18]. The data in the international practice survey suggests that naturopaths/naturopathic doctors were considering body weight, metabolic disorders, and diet and lifestyle changes in the context of patient care, all of which are important modifiable risk factors for morbidity and mortality [8]. A 2019 scoping review demonstrated that whole-system naturopathic practice was effective across a broad range of chronic diseases [19]. Further clinical research that explores the patient outcomes of naturopathic care for the prevention of these globally important conditions is urgently needed.

Naturopaths/Naturopathic Doctors commonly employ Multiple Types of Practices, Therapies and Treatments

The study describes unique and diverse practices and therapeutic interventions employed by naturopaths/naturopathic doctors as part of routine patient care, and that are often not employed by other types of clinicians. While some treatments were prescribed or recommended in most cases (dietary modifications, lifestyle changes, herbal medicines, nutritional products), there were many other treatment categories reported. In addition, the study results provide evidence that the naturopaths/naturopathic doctors were employing multiple treatments simultaneously in the care of an individual patient. This finding aligns with a report by the WNF describing the content of naturopathic curricula worldwide which noted that applied nutrition (dietary prescription), clinical nutrition (individualized nutritional product prescription), and herbal medicine (botanical medicine) are taught in more than 90% of recognized naturopathic programs internationally [4]. According to the WNF Roots Report [4], lifestyle counselling is not commonly taught as a standalone course within naturopathic curricula, but was still listed in more than 70% of cases in our study. While it is possible that lifestyle counselling may be integrated into other aspects of curriculum, this discrepancy between the use of lifestyle prescription in practice and the frequency of its specific inclusion in naturopathic curricula highlights a need for further investigation. In particular, a closer examination of the content and impact of tacit content and the need for naturopathic educational organizations to address any gaps in training in some countries is warranted. Given the importance of lifestyle interventions in prevention and management of NCDs and the findings of our study, this is an important area of naturopathic care.

Methods

The study included naturopaths/naturopathic doctors who were currently in practice and a member of a naturopathic association recognised by the WNF. Participants were required to have been in practice for at least five years, seeing more than ten patients per week, and to have a computer terminal in their clinic. Naturopaths/naturopathic doctors were excluded if they identified as practicing within a specialized field (e.g., primarily focused on treating cancer or female reproductive conditions).

Results

A total of 851 patient encounters were reported by the 56 naturopaths/naturopathic doctors that participated

in the survey. Their results indicated that most patients seeking naturopathic care were female (72.6%). All age categories were represented with a similar proportion for 36 – 45 years (20.2%), 46 – 55 years (19.5%), and 56 – 65 years (19.3%) categories. Approximately two-thirds (67.0%) of patients were described as attending the naturopathic doctor's/naturopath's clinic for a follow-up visit. A substantial majority (75%) of patients were considered by the participating naturopath/naturopathic doctor to be presenting with a chronic health condition.

Health Conditions

The survey inquired about the patient's presenting complaint and associated symptoms or conditions that were considered important in the management of the primary condition. There were over 80 different conditions reported by patients which were grouped into the following categories: musculoskeletal, gastrointestinal, mental health, general wellness and prevention, female reproductive, skin/integumentary, respiratory, maternal health, neurological, endocrine, cancer, cardiovascular, weight management, autoimmune, urogenital, ageing/cognition, and infectious diseases.

The primary reason for the patient visiting with the naturopath/naturopathic doctor was quite varied and is presented in Table 9.1. The most prevalent categories of health conditions reported were musculoskeletal (18.5%), gastrointestinal (12.2%), and mental illness (11.0%). General wellness and prevention were also cited as a primary reason for patients consulting with their naturopath or naturopathic doctor (6.7%). Patients reported as presenting with a musculoskeletal complaint as their primary concern, were most frequently identified as having chronic musculoskeletal pain (48.4%), injury (19.1%) or osteoarthritis (12.7%). Participant naturopaths/naturopathic doctors indicated patients reporting a gastrointestinal condition were most frequently presenting with irritable bowel syndrome (31.7%), gastro-esophageal reflux (17.3%), or food allergy, intolerance, or sensitivity (16.4%).

Naturopathic practice is holistic and focuses on treating the whole person [16]. There is a recognition that all aspects of the body are interconnected. The results from this survey indicated that when naturopaths/naturopathic doctors were asked to identify other physiological systems or health concerns being considered in the management of each patient's health, they reported that the majority of patient's health concerns were considered to be influenced by more than one physiological system (two systems: 20.4%; three systems: 19.0%; four or more systems: 21.8%) [2]. The gastrointestinal system was most frequently selected (40.8%). Less common but still prevalent was general wellness and prevention (28.7%) and the endocrine system (23.8%).

Table 9.1: Primary health condition for which patients seek assistance and importance of other physiological systems in management of the patient's case, as reported by naturopaths/naturopathic doctors (n=854)

Physiological system or category of the primary health condition	All responses n (%)	Specific primary health condition	Responses within the system or category n (%)	Considered important in management of primary condition [All responses, n (%)]
Musculoskeletal	158 (18.5)	Chronic musculoskeletal pain	76 (48.4)	151 (17.7)
		Injury	30 (19.1)	
		Osteoarthritis	20 (12.7)	
		Fibromyalgia or chronic fatigue syndrome	12 (7.6)	
		Sciatica	4 (2.6)	
		Other	15 (9.6)	
Gastrointestinal	104 (12.2)	Irritable bowel syndrome	33 (31.7)	348 (40.8)
		Gastro-esophageal reflux	18 (17.3)	
		Food allergy/intolerance/sensitivity	17 (16.4)	
		Dysbiosis or parasites	8 (7.7)	
		Liver and biliary dysfunction and disease	6 (5.8)	
		Symptomatic constipation	3 (2.9)	
		Symptomatic diarrhea	2 (1.9)	
		Inflammatory bowel disorders	1 (1.0)	
		Other	16 (5.8)	
Mental health	93 (11.0)	Anxiety	26 (28.0)	133 (15.5)
		Depression	20 (21.5)	
		Stress or fatigue	17 (18.3)	
		Bipolar disorder	7 (7.5)	
		ADHD	6 (6.5)	
		Insomnia and other sleep disorders	5 (5.4)	
		ASD	2 (2.2)	
		Addiction	2 (2.2)	
		Other	8 (8.6)	
General wellness and prevention	57 (6.7)	-	-	245 (28.7)
Female reproductive	51 (6.0)	Menopausal symptoms	20 (39.2)	134 (15.7)
		Dysmenorrhea and other menstrual complaints	12 (23.5)	
		Polycystic ovarian syndrome (PCOS)	9 (17.7)	
		Endometriosis	6 (11.7)	
		Fibroids and other benign tumors	3 (5.9)	
		Other	1 (2.0)	
Skin/Integumentary	44 (5.2)	Inflammatory skin conditions	25 (56.8)	79 (9.3)
		Acne vulgaris	11 (25.0)	
		Other	8 (18.2)	
Respiratory	43 (5.0)	Congestive respiratory disorders	23 (53.5)	71 (8.3)
		Respiratory tract infection	8 (18.6)	
		Asthma	6 (14.0)	
		Other	6 (14.0)	

Section 3: Practice and Implementation of Naturopathy in Health Care Systems

Maternal health	43 (5.0)	Fertility	23 (54.8)	29 (3.4)
		Pregnancy	11 (26.2)	
		Preconception care	5 (11.9)	
		Lactation, breastfeeding, and other postpartum care	3 (7.1)	
Neurological	43 (5.0)	Headache/migraine	24 (55.8)	67 (7.9)
		Neuralgia	7 (16.3)	
		Parkinson's disease	3 (7.0)	
		Paralysis and partial paralysis	3 (7.0)	
		Carpel tunnel syndrome	1 (2.3)	
		Other	5 (11.6)	
Endocrine	40 (4.7)	Thyroid abnormalities	22 (55.0)	203 (23.8)
		Type 2 diabetes	5 (12.5)	
		Adrenal insufficiency	5 (12.5)	
		Insulin resistance or metabolic syndrome	4 (10.0)	
		Other	4 (10.0)	
Cancer	39 (4.6)	Active, malignant cancer	17 (43.6)	29 (3.4)
		Post-cancer recovery, support, and prevention	11 (28.2)	
		Management of cancer treatment side effects	5 (12.8)	
		Palliative care	3 (7.7)	
		Benign cancer	2 (5.1)	
		Other	1 (2.6)	
Cardiovascular	36 (4.2)	Hypertension	15 (41.7)	108 (12.7)
		Chronic venous insufficiency/poor circulation	9 (25.0)	
		Atherosclerosis and/or dyslipidemia	6 (16.7)	
		Stroke-related complaints	4 (11.1)	
		Other	2 (5.6)	
Weight management	34 (4.0)	–	–	147 (17.2)
Autoimmune	31 (3.6)	Systemic (e.g., SLE/lupus, Rheumatoid arthritis, ankylosing spondylitis)	18 (58.1)	74 (8.7)
		Gastrointestinal (coeliac, Crohn's, ulcerative colitis)	5 (16.1)	
		Nervous system (e.g., multiple sclerosis, myasthenia gravis)	3 (9.7)	
		Thyroid (e.g., Grave's, Hashimoto's)	2 (6.5)	
		Type 1 diabetes	2 (6.5)	
		Other	1 (3.2)	
Urogenital	21 (2.5)	Urinary tract infection	8 (38.1)	41 (4.8)
		Benign prostate hypertrophy	5 (23.8)	
		Kidney disease	3 (14.3)	
		Other infections	3 (14.3)	
		Incontinence	2 (9.5)	
Ageing and cognition	10 (1.2)	Alzheimer's disease or dementia	4 (40.0)	69 (8.1)
		Healthy ageing support	3 (30.0)	
		Other cognitive impairment	3 (30.0)	
Infectious disease	7 (0.8)	Lyme disease	3 (42.9)	27 (3.1)
		Epstein-Barr virus	2 (28.6)	
		Other	2 (28.6)	

Table 9.2: Categories of treatments prescribed to patients, as reported by naturopaths/naturopathic doctors (n=859)

Category of treatment prescribed	N (%)
Dietary changes	517 (60.5)
Lifestyle behaviour changes	486 (56.9)
Herbal medicines	463 (54.2)
Nutritional supplements	445 (52.1)
Acupuncture	233 (27.2)
Manual therapies	189 (22.1)
Homeopathy	188 (22.0)
Counselling and psychotherapy	160 (18.7)
Other energetic medicines	137 (16.0)
Testing or investigations	117 (13.7)
Hydrotherapy	115 (13.5)
Other Traditional medicine systems	110 (12.9)
Invasive therapies	58 (6.8)
Other treatments	222 (26.0)

Clinical management and collaborative care

As outlined in Table 9.2, the most common treatment categories prescribed or recommended to patients were dietary changes (60.5%), lifestyle and behaviour changes (56.9%), herbal medicines (54.2%) and nutritional supplements (52.1%). These therapies were followed by acupuncture (27.2%), manual therapies (22.1%), homeopathy (22.0%) and counselling (18.7%). Participating naturopaths/naturopathic doctors reported prescribing or recommending a mean of 4.0 different treatment categories for each individual case.

Approximately one third of patients (33.0%) reported to be only consulting with the participant naturopath/naturopathic doctors to manage their presenting health concern. Many patients were also under the care of a general practitioner (43.2%) or a specialist medical practitioner (27.8%). Co-treatment by an allied health practitioner (12.4%) or a complementary medicine practitioner (10.9%) was less prevalent.

Summary

Naturopaths/naturopathic doctors provide health care for diverse health conditions across the life span. Patients are consulting with naturopaths/naturopathic doctors for support with health conditions of global importance and there is emerging evidence to suggest naturopathic care may benefit individuals with some of these conditions. Naturopaths/naturopathic doctors across the world adopt an integrative approach to the diagnosis and treatment strategies of chronic and complex health care complaints. Overall, the study demonstrates that naturopaths/naturopathic doctors provide an aspect of primary care, and health promotion and disease prevention that is accessed by individuals around the world.

Literature Cited

1. Steel, A., Foley, H., Bradley, R., Van De Venter, C., Lloyd, I., Schloss, J., Wardle, J., and Reid, R., *Overview of international naturopathic practice and patient characteristics: results from a cross-sectional study in 14 countries*. BMC Complementary Medicine and Therapies, 2020. **20**(1): p. 59.
2. Steel, A., Goldenberg, J.Z., Hawrelak, J.A., Foley, H., Gerontakos, S., Harnett, J.E., Schloss, J., and Reid, R., *Integrative physiology and traditional naturopathic practice: Results of an international observational study*. Integrative Medicine Research, 2020. **9**(4): p. 100424.
3. World Naturopathic Federation. *World Naturopathic Federation Report. Findings from the 1st World Naturopathic Federation survey*. 2015; Available from: http://worldnaturopathicfederation.org/wp-content/uploads/2015/12/World-Federation-Report_June2015.pdf.
4. World Naturopathic Federation. *The World Naturopathic Federation Roots Report – Findings from the Naturopathic Roots Committee survey*. 2016; Available from: <http://worldnaturopathicfederation.org/wnf-publications/>.
5. Vanselow, N.A., Donaldson, M.S., and Yordy, K.D., *A New Definition of Primary Care*. Journal of the American Medical Association, 1995. **273**(3): p. 192-192.
6. Iacoviello L, Bonaccio M, Cairella G, Catani M, Costanzo S, D’Elia L, Giacco R, Rendina D, Sabino P, and Savini I, *Diet and primary prevention of stroke: Systematic review and dietary recommendations by the ad hoc Working Group of the Italian Society of Human Nutrition*. Nutrition, Metabolism and Cardiovascular Diseases, 2018. **28**(4): p. 309-334.
7. Mathers CD and Loncar D, *Projections of Global Mortality and Burden of Disease from 2002 to 2030*. Samet J, editor. PLoS Med (Internet). Public Library of Science, 2018. **28**.
8. Institute for Health Metrics and Evaluation (IHME), *Findings from the Global Burden of Disease Study 2017*. 2018, IHME: Seattle, WA.
9. Stewart, J., Manmathan, G., and Wilkinson, P., *Primary prevention of cardiovascular disease: A review of contemporary guidance and literature*. JRSM cardiovascular disease, 2017. **6**: p. 2048004016687211.
10. Haw J, Galaviz K, Straus A, Kowalski, A., Magee, M., Weber, M., Wei, J., Narayan, K.M.V., and Ali, M., *Long-term Sustainability of Diabetes Prevention Approaches: A Systematic Review and Meta-analysis of Randomized Clinical Trials*. Journal of the American Medical Association Internal Medicine, 2017. **177**.
11. Burns, D.M., *Primary prevention, smoking, and smoking cessation: implications for future trends in lung cancer prevention*. Cancer, 2000. **89**(S11): p. 2506-2509.
12. Meguid El Nahas, A. and Bello, A.K., *Chronic kidney disease: the global challenge*. Lancet, 2005. **365**(9456): p. 331-40.
13. Rennard, S.I. and Drummond, M.B., *Early chronic obstructive pulmonary disease: definition, assessment, and prevention*. Lancet, 2015. **385**(9979): p. 1778-1788.
14. Norton S, Matthews F, Barnes D, Yaffe K, and Brayne C, *Potential for primary prevention of Alzheimer’s disease: an analysis of population-based data*. The Lancet Neurology, 2014. **13**(8): p. 788-794.
15. Yamaya, M., Ohru, T., Kubo, H., Ebihara, S., Arai, H., and Sasaki, H., *Prevention of respiratory infections in the elderly*. Geriatrics & Gerontology International, 2002. **2**(3): p. 115-121.
16. Hausser, T., Lloyd, I., Yáñez, J., Cottingham, P., Newman-Turner, R., and Abascal, A. *WNF White Paper: Naturopathic Philosophies, Principles and Theories*. 2017; Available from: http://worldnaturopathicfederation.org/wp-content/uploads/2015/12/White-Paper_FINAL.pdf.
17. Yarnall, K.S., Pollak, K.I., Østbye, T., Krause, K.M., and Michener, J.L., *Primary care: is there enough time for prevention?* American Journal of Public Health, 2003. **93**(4): p. 635-41.
18. Ali, A. and Katz, D.L., *Disease Prevention and Health Promotion: How Integrative Medicine Fits*. American Journal of Preventive Medicine, 2015. **49**(5 Suppl 3): p. S230-40.
19. Myers S P and Vigar V, *The State of the Evidence for Whole-System, Multi-Modality Naturopathic Medicine: A Systematic Scoping Review*. Journal of Alternative and Complementary Medicine, 2019. **25**(2): p. 141-168.

10 International Prevalence of Consultations with a Naturopath/ Naturopathic Doctor

Amie Steel, ND PhD
Andy McLintock, ND
Janet Schloss, ND PhD
Holger Cramer, Naturopath PhD
Rebecca Redmond, Naturopath

Joshua Goldenberg, ND
Matthew Leach, ND, PhD
Joanna Harnett, ND PhD
Claudine Van de Venter, ND
Ryan Bradley, ND

Jason Hawrelak, ND PhD
Kieran Cooley, ND PhD
Brenda Leung, ND PhD
Jon Wardle, ND PhD

HIGHLIGHTS

- Naturopaths/NDs may be consulted by between 0.4% and 8% of the general population in any 12-month period.
- There are over 110,000 naturopaths/ND practicing in at least 108 countries spanning all WHO Regions.
- The naturopathic workforce has a significant presence globally and it is estimated that the global naturopathic workforce sees over 5.5 million patients per month.
- Despite the many countries where naturopathy is practice, there is limited data outlining the prevalence of naturopathic consultations in each country.

In response to an increase in the use of traditional and complementary medicine (including the utilization of naturopathic health services), the World Health Organization (WHO) has developed global strategies to ensure access to safe and effective healthcare which include promoting the integration of traditional and complementary therapies (including naturopathy) into healthcare systems [1]. Several international research studies suggest the demand for naturopathic health services may be attributed to personal health care beliefs, dissatisfaction with biomedical care, increased disease severity and unmet health care needs [2-5]. Nevertheless, further research is required to explore the international prevalence of naturopathic health services utilization to help determine the current and potential contribution of naturopathy to the broader health system to help advance patient and population health care and outcomes. As such, this chapter presents an estimate, through meta-analysis of existing best evidence, of the global prevalence of consultations with a naturopathic practitioner by the general population.

Implications

This review presents the most recent available evidence of the global prevalence of consultation with naturopaths/naturopathic doctors and presents the 12-month prevalence of use of naturopathy/naturopathic medicine in the general population across four WHO Regions of the world. Of the Regions with reported prevalence rates, the highest was in Eastern Mediterranean (Israel) with 18% (2007) to 20% (1993) of the general population seeking the services of a naturopath/naturopathic doctor. The lowest reported national prevalence of consultation was observed in the Americas (USA) with 0.4% (2012). Lifetime prevalence of use was reported in only two countries: Canada (6% in 1997 to 11% in 2016); and India (7% rural, 12% urban in 2011/12). Where more than one timeframe of data was available there was a relative amount of consistency across time suggesting naturopathy/naturopathic medicine use is temporally stable in these countries. Despite the gaps in the available prevalence data, based on the estimated number of naturopaths/naturopathic doctors globally [6] and the known average number of patients seen by naturopaths/naturopathic doctors [7], it is estimated that the global

naturopathic workforce provides care to over 5.5 million individuals per month.

The wide range in the rates of consultation with a naturopath/naturopathic doctor may reflect differences in the perception and availability of naturopathy in specific countries. For example, while national prevalence of consultations with naturopaths in the USA is relatively low, this may obscure significant heterogeneity within that region. For example, insurance data from Washington state shows prevalence of naturopathic consultation to be four times higher than the national prevalence (1.6% v 0.4%) [8]. Such heterogeneity may be similarly observed in other regions and may be due to several factors. For example, in the USA recognition of the naturopathic profession through licensure is not uniformly applied across that nation [9], and distribution of the naturopathic workforce has historically been determined by the proximity to naturopathic schools [10]. Insurance coverage is also known to be a significant driver of naturopathic use [8], and variable insurance coverage arrangements for naturopathy – as observed in the USA [11] – may also result in regional differences. Further attention towards regional variations and heterogeneity, particularly as it relates to specific barriers and facilitators to appropriate utilization of naturopathic services – is warranted.

The wide range in rates of use may also reflect differences in scope and practice. For example, in the USA, naturopathic physicians are considered to bridge conventional medicine and CAM modalities [12], while in Germany, naturopathic practitioners known as “Heilpraktiker” are a distinct category and reportedly have inconsistent training and clinical abilities [13]. As such, the term naturopathy may be differentially classifying practitioners due to professionalization, resulting in an underestimate of use in some countries and overestimate in others. Further consideration of the implications associated with the inconsistent ‘protection’ of professional titles and defined scopes of practice for naturopaths/naturopathic doctors by country is likely to influence the prevalence of use by the public [14].

Prevalence data from some countries may also be impacted by definitional difficulties or confusion around the term ‘naturopathy’. For example, naturopathy is often grouped under a broader nomenclature as one of the many modalities or therapies considered ‘complementary approaches to healthcare’ [15] and may not be individually evaluated and are not included in our analysis. Multiple practitioner types may also present difficulties for data collection. For example, a review of CAM services in the EU, of the (22,300) practitioners of naturopathy, 15,000 were identified as (mostly German) medical doctors [16]. Thus, patients may not identify obtaining naturopathy as a service per se, but as part of the standard care they receive from a medical doctor who integrates naturopathic principals or modalities into their practice. This may be one reason why three of the

largest European countries by naturopathic workforce (Germany, Portugal and Spain [14]) were not represented in this review. To properly evaluate the potential role of naturopaths in care delivery, it is imperative that there should be a focus on capturing important naturopathic health services and workforce research data in all countries where there is a significant naturopathic presence.

Furthermore, although naturopathic practice is relatively consistent globally, local, and regional variations in preferred therapies may result in point-of-service differences that may impact prevalence of naturopathic consultations in those countries. For example, in the United Kingdom historical connections between osteopathy and naturopathy may drive naturopathic use for musculoskeletal conditions in that country more than in countries like Australia, where the professions naturopathy and herbalism have had a larger shared history and maintain connections [17]. Some studies in this review explicitly combined queries about naturopathic utilization with other CAM practices – for example, herbalism and naturopathy in the Australian study. Thus, it is important that a reliable validated instrument is developed for collecting more specific data about naturopathic service utilization within and across countries to establish ‘true’ prevalence of use information.

While the prevalence data provides a snapshot of a given populations’ use of naturopathy, less is known about the factors associated with that use. For example, factors that have previously been raised as impacting the use of naturopathy/naturopathic medicine, include licensure and regulation, scope of practice, training of new students and therefore number of naturopaths/naturopathic doctors in the workforce, or country-specific health systems that influence the support and reimbursements of naturopathic services (e.g. insurance vs out of pocket) [18]. By focusing on general population utilization, this study may also not reflect differences in prevalence of use for different clinical conditions. For example, Australian studies published before 2010 show self-reported prevalence of naturopathic use among the general population of mid-aged women to be 8.7%, while rates for cancer (15.7%) and depression (22.2%) were significantly higher [3]. Similar variations were seen in insurance data from Washington state in the US, where 7.1% of insured cancer patients made claim for naturopathic treatment, compared to 1.6% of general enrollees [8].

Methods

A systematic electronic search of the research databases was conducted in September-October 2019. The databases searched were MEDLINE, AMED, EMBASE, CINAHL, Global Health, WHO Iris, PROQUEST dissertations database, and Lilac. A search for grey literature was also performed. The search targeted countries where,

according to the *WHO Global Report on Traditional and Complementary Medicine (2019)* [19], naturopaths/naturopathic doctors are providing care to the community. The search was performed using the Google search engine and the terms *prevalence, use, naturopathy, report*, and the country name. Articles were included that reported original data from cohort studies, cross-sectional studies, survey research, case-control studies, prevalence studies or epidemiologic studies. To be included in the review, the studies had to report on the general population prevalence of consultations with a naturopathic practitioner either in the previous 12 months, or over the user's lifetime. All relevant papers were included irrespective of language of publication or risk of bias score. Articles were excluded that presented results from specific sub-patient populations (e.g., children, female specific, age limitations, illness populations). Studies were also excluded if they only presented the prevalence of consultations with other health professionals that may use treatments commonly associated with naturopathy (e.g. herbal medicine, hydrotherapy, yoga etc.) but were not explicitly named as naturopathic practitioners, or where naturopathic consultation rates were conflated with a cumulative group of health practice, such as complementary and alternative medicine (CAM), rather than a specific prevalence of naturopathic consultations. Studies were also excluded if they were published before 2010. Identified papers were assessed for risk of bias of the reported studies using the tool developed by Hoy et al [20].

Analysis

The results were grouped for narrative presentation of results in accordance with the WHO Regions [21]. Where studies reported the results of more than one year, they were treated as different studies in the analysis. Articles with unclear numerators or denominators were calculated by the research team where the necessary information was provided or checked against source documents for the same study. Authors were contacted to verify information not able to be determined through these other methods.

Weighted prevalence rates with 95% confidence intervals (95% CI) were calculated for 12-month prevalence and lifetime prevalence separately. Further, separate analyses were conducted for a) country of origin and b) WHO Regions. Heterogeneity between studies was estimated based on the raw proportions, by using the I^2 statistics. Intervals were defined as follows [22, 23]: low heterogeneity (I^2 of 0 – 24%); moderate heterogeneity (I^2 of 25 – 49%); substantial heterogeneity (I^2 of 50 – 74%); relevant heterogeneity (I^2 of 75 – 100%). In order to assess heterogeneity, χ^2 tests were conducted with $p \leq 0.10$ [23].

Results

Search Characteristics

The database search identified 13968 citations including 2509 duplicates. Of these, 11370 were excluded through title and abstract filtering. The full text of the remaining 89 articles were assessed for eligibility against the inclusion criteria and 82 were excluded. This resulted in 7 articles being retained. The reference list and subsequent citations of the remaining articles were checked and an additional 19 articles (3 references; 16 citations) were identified of which one additional article was found to meet the inclusion criteria for this review.

Study Characteristics

The studies reporting naturopathy use in a national population over the previous 12 months represent four WHO Regions: European ($n=2$) [24, 25], Eastern Mediterranean ($n=1$) [26], Region of the Americas ($n=3$) [27-29], and the Western Pacific ($n=1$) [30] (see Table 10.1). One of these studies from Canada also presented prevalence of naturopathy use at any time over the users' lifetime [29]. One additional study from India (South East Asian Region) did not specify the period of use [21] (see Table 10.2). All studies sampled the general population of adults and were either reported as nationally representative or demonstrated a distribution of economic categories except for one study from Israel whereby the majority of participants' subjective economic status was 'very good' or 'good' [26]. Four studies included prevalence data from more than one time point [25-27, 29], with the earliest data collected in 1993 [26]. Two papers reported data from the same national cohort study, but from different time points [27, 28]. All studies included participants from both urban and rural locations. All studies included were determined to have a low risk of bias except for one study that was identified to be exposed to non-response bias [26].

Summary of findings

The included studies presented a prevalence of naturopathy use in the previous 12 months. Studies from the European Region reported between 2% in the UK [24] through to 7.7% in Switzerland. The only study from the Eastern Mediterranean Region reported prevalence rates for Israel [26] as 20% in 1993 through to 18% in 2007. Studies from the Region of the Americas reported between 3% (in 1997) and 5% (in 2016) of the general population using naturopathy in Canada [29] and between 0.25% (in 2002) and 0.4% (in 2015) in the United States [27, 28]. The only study providing national prevalence data from the Western Pacific Region was from Australia and reported 6.2% of the population used naturopathy in the previous 12 months [30]. In addition to the data reporting use in the previous 12 months,

Table 10.1: Summary information of included studies reporting prevalence of use of naturopathy in the previous 12 months

WHO Region	Country (WHO Region)	Author	Economic status	Year data collected	Population	Naturopathy descriptor	Setting (e.g., urban, rural)	N	Overall use (%)
European	England	Hunt et al (2010)	Nationally representative	2005	General population	Naturopathy	Both	7630	2%*
	Switzerland	Klein et al. (2015)	Nationally representative	2007, 2012	General population	Naturopathy	Both	2007: 14,432 2012: 18,357	2007: n=1185; 7.7% 2012: n=1597; 7.7%
Eastern Mediterranean	Israel	Shmueli, et al (2010)	Subjective economic status 'very good' or 'good' range from M=0.49 to M=0.58	1993, 2000, 2007	General population	Naturopathy	Urban	1993: 2003 2000: 2505 2007: 752	1993: n=400; 20% 2000: n=425; 17% 2007: n=135; 18%
	Canada	Esmail (2017)	Evenly distributed (<\$20 000 - >\$79 999)	1997, 2006, 2016	General population	Naturopathy	National	1997: 1500 2006: 2000 2016: 2000	1997: n=45; 3% 2006: n=80; 4% 2016: N=100; 5%
USA		Su and Li (2011)	Nationally representative	2002, 2007	General population	Naturopathy	National	2002: 30267 2007: 20769	2002: n=76; 0.25% 2007: n=71; 0.34%
		Clarke et al (2015)	Nationally representative	2012	General population	Naturopathy	National	38280	n=153; 0.4%
Western Pacific	Australia	McIntyre et al. (2019)	Manageability on household income; impossible, difficult all/some of time (58.6%), not too bad / easy (41.4%)	2017	General population	Naturopathy and Western Herbal Medicine	Both Urban: 72.6% Inner regional: 18.7% Outer reg/ remote: 8.7%	2019	n=126; 6.2%

* Estimated figure based on interpretation of the chart included in the article.

Table 10.2: Information of included studies reporting prevalence of use of naturopathy in the user's lifetime

WHO Region	Country (WHO Region)	Author	Economic status	Design (measure)	Year data collected	Population	Naturopathy descriptor	Setting (e.g., urban, rural)	N	Duration of exposure	Overall use (%)
Region of the Americas	Canada	Esmail (2017)	Evenly distributed (<\$20 000 - >\$79 999)	Cross-sectional (survey)	1997, 2006, 2016	General population	Naturopathy	Both	1500 (1997), 2000 (2006), 2000 (2016)	Ever used	1997: 6% 2006: 9% 2016: 11%
South-East Asian	India	Srinivasan and Raji Sugumar (2017)	Diversity of occupation, social group, education, and religion	Cross-sectional (survey)	2011-2012	Households in the general population	Naturopathy and yoga	Both	Total: 65507 Urban: 26996 Rural: 38511	Not specified	Total: n=6616 (10%) Urban: n=3227 (12%) Rural: n=2607 (7%)

two studies reported prevalence of use over other time periods. One study from the Region of the Americas, specifically Canada, indicated 6% of the general population in 1997, 9% in 2006 and 11% in 2016 used naturopathy at some time in the user's lifetime [29]. A second study from the South-East Asian Region reported a total of 10% of the population had used naturopathy and yoga, but the timeframe of their use was not specified [21].

Meta-analysis findings

The estimated 12-month prevalence rates of naturopathy use for different countries are shown in Figure 10.1. Prevalence rates significantly differed between countries ($p < 0.001$) and ranged from less than 1% of the population in the USA to 8% in Switzerland. While the primary studies were subject to wide heterogeneity, significant heterogeneity was only found for Canada ($p = 0.01$) and the USA ($p < 0.001$). With regard to WHO Regions, 12-month prevalence of naturopathy use ranged from 1%

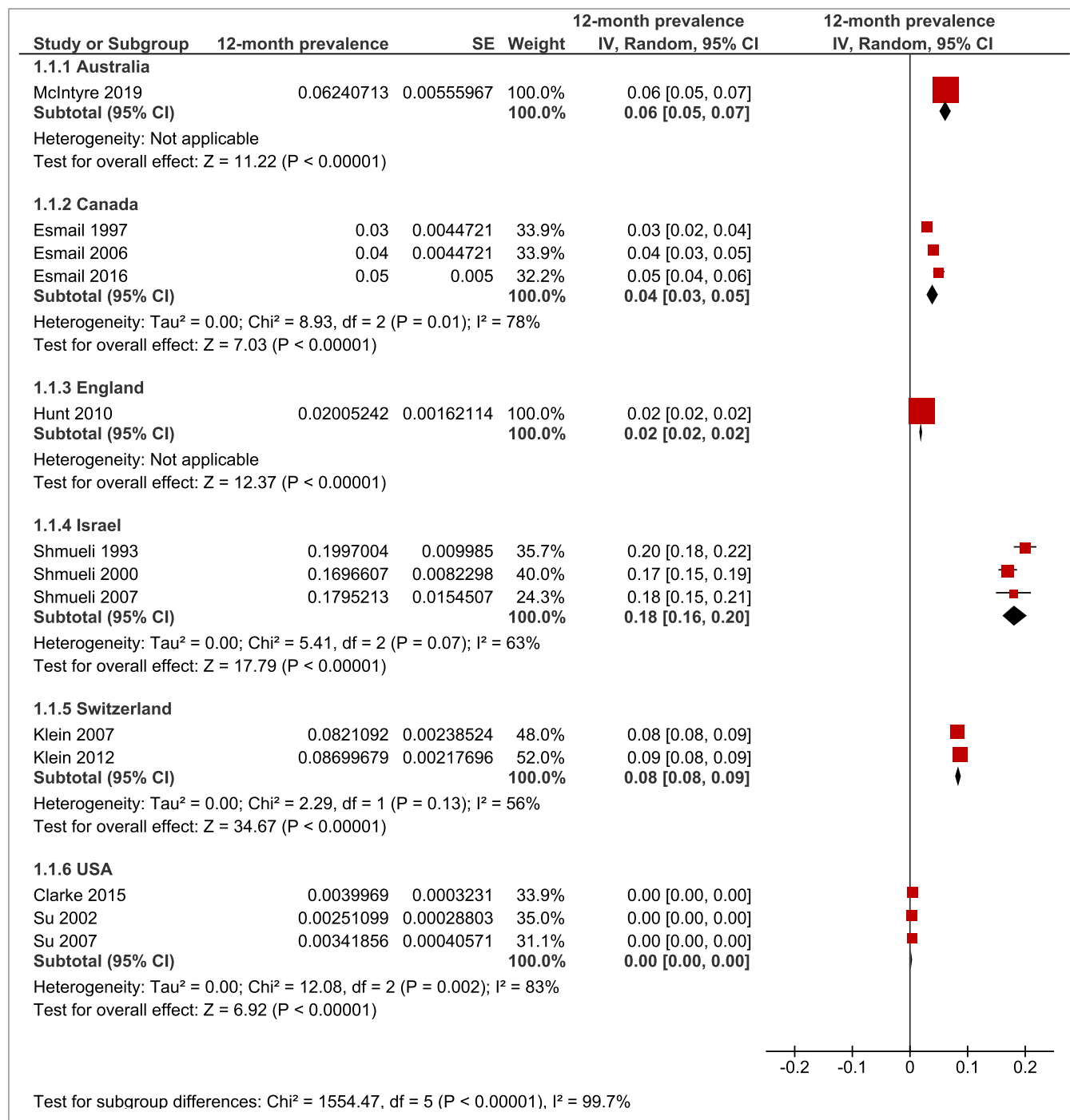


Figure 10.1: 12-month prevalence of naturopathy use in different countries

in the Region of the Americas to 6% in European and Western Pacific Regions, again with significant differences between Regions ($p < 0.001$; Figure 10.2). Relevant and statistically significant heterogeneity was present in studies on European Region ($p < 0.001$), and Region of the Americas ($p < 0.001$). Since all studies were classified as low risk of bias, no sensitivity analyses were conducted. Due to the paucity and heterogeneity of studies reporting life-time prevalence, no meta-analysis could be conducted.

Limitations

One of the limitations of prevalence studies in the context of naturopathy, is they fail to capture the breadth of treatments that is unique to naturopathy and they do not capture data associated with the quality of care, role within healthcare systems, nor the efficacy and safety of

naturopathic approaches to the management of specific conditions [31]. Thus, research into the quality, safety, efficacy, and cost effectiveness of naturopathy/naturopathic medicine would provide pragmatic understanding about the contribution of naturopathy to healthcare within populations and more broadly across the world. Additionally, although limiting data collection to studies published after 2010 helps to ensure prevalence data most accurately reflects contemporary utilization, such time limits may have excluded some studies in regions that were missing from the review. Additionally, observing changes in prevalence of naturopathic consultations over time may also be able to offer insights into the changing role of naturopathy/naturopathic medicine in relation to health systems changes or generational health needs [32].

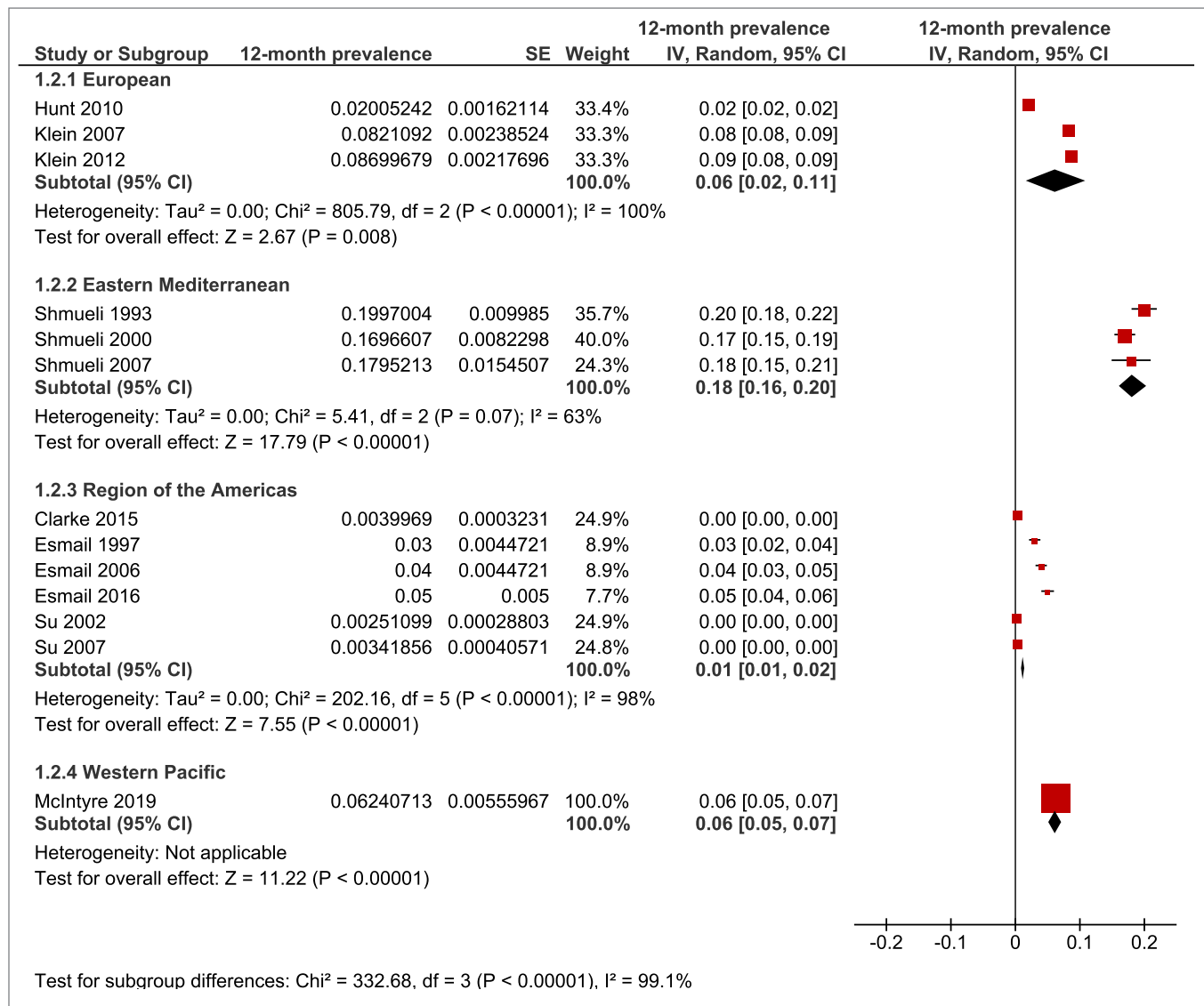


Figure 10.2: 12-month prevalence of naturopathy use in different WHO Regions

Summary

Although the naturopathic workforce has a significant presence globally, there is limited data on prevalence of naturopathic consultations. Twelve-month prevalence of

naturopathy/naturopathic medicine use ranged from 1% in the Region of the Americas to 6% in European and Western Pacific Regions, though there are significant differences between and within Regions, which may be driven by a range of policy, legislative and social factors.

Literature Cited

- World Health Organization, *World Health Organisation Traditional Medicine Strategy 2014 – 2023*. 2013: Geneva.
- Leach, M.J., *Profile of the complementary and alternative medicine workforce across Australia, New Zealand, Canada, United States and United Kingdom*. *Complementary Therapies in Medicine*, 2013. **21**(4): p. 364-78.
- Reid, R., Steel, A., Wardle, J., Trubody, A., and Adams, J., *Complementary medicine use by the Australian population: a critical mixed studies systematic review of utilisation, perceptions and factors associated with use*. *BMC Complementary and Alternative Medicine*, 2016. **16**(1): p. 176.
- Leach, M.J., *Determinants of Complementary Medicine Service Utilization in a Regional South Australian Population: A Cross-Sectional Study*. *The Journal of Rural Health*, 2021. **37**(1): p. 69-80.
- Bradley, R., Sherman, K.J., Catz, S., Calabrese, C., Jordan, L., Grothaus, L., and Cherkin, D.C., *Survey of CAM interest, self-care, and satisfaction with health care for type 2 diabetes at group health cooperative*. *BMC Complementary and Alternative Medicine*, 2011. **11**(1): p. 1-9.
- World Naturopathic Federation. *Naturopathic Numbers Report*. 2016; Available from: <http://worldnaturopathicfederation.org/wp-content/uploads/2015/12/2016-Naturopathic-Numbers-Report.pdf>.
- Steel, A., Schloss, J., Leach, M., and Adams, J., *The naturopathic profession in Australia: A secondary analysis of the Practitioner Research and Collaboration Initiative (PRACI)*. *Complementary Therapies in Clinical Practice*, 2020. **40**: p. 101220.
- Lafferty, W.E., Bellas, A., Corage Baden, A., Tyree, P.T., Standish, L.J., and Patterson, R., *The use of complementary and alternative medical providers by insured cancer patients in Washington State*. *Cancer*, 2004. **100**(7): p. 1522-30.
- Fleming, S.A. and Gutknecht, N.C., *Naturopathy and the primary care practice*. *Primary Care: Clinics in Office Practice*, 2010. **37**(1): p. 119-136.
- Albert, D.P. and Butar, F.B., *Distribution, concentration, and health care implications of naturopathic physicians in the United States*. *Complementary Health Practice Review*, 2004. **9**(2): p. 103-117.
- Whedon, J., Tosteson, T.D., Kizhakkeveetil, A., and Kimura, M.N., *Insurance reimbursement for complementary healthcare services*. *The Journal of Alternative and Complementary Medicine*, 2017. **23**(4): p. 264-267.
- Litchy, A.P., *Naturopathic physicians: holistic primary care and integrative medicine specialists*. *Journal of Dietary Supplements*, 2011. **8**(4): p. 369-377.
- Heudorf, U., Carstens, A., and Exner, M., *Naturopathic practitioners and the public health system. Legal principles as well as experience from naturopathic practitioner candidate tests and hygiene inspections of naturopathic practitioner's practices in the Rhine-Main area in 2004 – 2007*. *Bundesgesundheitsblatt, Gesundheitsforschung, Gesundheitsschutz*, 2010. **53**(2): p. 245-257.
- World Naturopathic Federation Roots Committee. *WNF – Naturopathic Roots Report*. 2016; Available from: http://worldnaturopathicfederation.org/wp-content/uploads/2015/12/Naturopathic-Roots_final-1.pdf.
- National Center for Complementary and Integrative Health. *Are You Considering a Complementary Health Approach?* 2016 [cited 2021 30 June]; Available from: <https://www.nccih.nih.gov/health/are-you-considering-a-complementary-health-approach>.
- von Ammon, K., Frei-Erb, M., Cardini, F., Daig, U., Dragan, S., Hegyi, G., di Sarsina, P.R., Sörensen, J., and Lewith, G., *Complementary and alternative medicine provision in Europe – first results approaching reality in an unclear field of practices*. *Complementary Medicine Research*, 2012. **19**(Suppl. 2): p. 37-43.
- World Naturopathic Federation. *World Naturopathic Federation Report. Findings from the 1st World Naturopathic Federation survey*. 2015; Available from: http://worldnaturopathicfederation.org/wp-content/uploads/2015/12/World-Federation-Report_June2015.pdf.
- Ooi, S.L., McLean, L., and Pak, S.C., *Naturopathy in Australia: Where are we now? Where are we heading?* *Complementary Therapies in Clinical Practice*, 2018. **33**: p. 27-35.
- World Health Organization, *WHO Global Report on Traditional and Complementary Medicine*. 2019: Geneva.
- Hsu, C., Sherman, K.J., Eaves, E.R., Turner, J.A., Cherkin, D.C., Crompton, D., Schafer, L., and Ritenbaugh, C., *New perspectives on patient expectations of treatment outcomes: results from qualitative interviews with patients seeking complementary and alternative medicine treatments for chronic low back pain*. *BMC Complementary Alternative Medicine*, 2014. **14**(1): p. 276.
- Srinivasan, R. and Sugumar, V.R., *Spread of traditional medicines in India: Results of national sample survey organization's perception survey on use of Ayush*. *Journal of*

- Evidence-based Complementary and Alternative Medicine, 2017. **22**(2): p. 194-204.
22. Higgins, J.P., Thompson, S.G., Deeks, J.J., and Altman, D.G., *Measuring inconsistency in meta-analyses*. *BMJ*, 2003. **327**(7414): p. 557-560.
 23. Higgins, J.P., Thomas, J., Chandler, J., Cumpston, M., Li, T., Page, M.J., and Welch, V.A., *Cochrane handbook for systematic reviews of interventions*. 2019: John Wiley & Sons.
 24. Hunt, K.J., Coelho, H.F., Wider, B., Perry, R., Hung, S.K., Terry, R., and Ernst, E., *Complementary and alternative medicine use in England: Results from a national survey*. *International Journal of Clinical Practice*, 2010. **64**(11): p. 1496-1502.
 25. Klein, S.D., Torchetti, L., Frei-Erb, M., and Wolf, U., *Usage of complementary medicine in Switzerland: Results of the Swiss health survey 2012 and development since 2007*. *PLoS One*, 2015. **10**(10).
 26. Shmueli, A., Igudin, I., and Shuval, J., *Change and stability: use of complementary and alternative medicine in Israel: 1993, 2000 and 2007*. *European Journal of Public Health*, 2011. **21**(2): p. 254-259.
 27. Su, D. and Li, L., *Trends in the use of complementary and alternative medicine in the United States: 2002 – 2007*. *Journal of Health Care for the Poor and Underserved*, 2011. **22**(1): p. 296-310.
 28. Clarke, T.C., Black, L.I., Stussman, B.J., Barnes, P.M., and Nahin, R.L., *Trends in the use of complementary health approaches among adults: United States, 2002 – 2012*. *National health statistics reports*, 2015(79): p. 1-16.
 29. Esmail, N., *Complementary and Alternative Medicine*. 2017: Fraser Institute.
 30. McIntyre, E., Adams, J., Foley, H., Harnett, J., Leach, M.J., Reid, R., Schloss, J., and Steel, A., *Consultations with Naturopaths and Western Herbalists: Prevalence of Use and Characteristics of Users in Australia*. *Journal of Alternative and Complementary Medicine*, 2019. **25**(2): p. 181-188.
 31. Myers, S. and Vigar, V., *The State of the Evidence for Whole-System Multi-Modality Naturopathic Medicine: A Systematic Scoping Review*. *The Journal of Alternative and Complementary Medicine*, 2019. **25**(2).
 32. Steel, A., Munk, N., Wardle, J., Adams, J., Sibbritt, D., and Lauche, R., *Generational differences in complementary medicine use in young Australian women: Repeated cross-sectional dataset analysis from the Australian longitudinal study on women's health*. *Complementary Therapies in Medicine*, 2019. **43**: p. 66-72.

11

Access and Equity in Naturopathic Care

Iva Lloyd, ND
Sophia Gerontakos, Naturopath
Valentina Cardozo, ND

HIGHLIGHTS

- Naturopathic community clinics (NCCs) serve marginalized populations and other specialized groups for low or no cost to patients.
- There are at least 100 NCCs around the world with 51% located in North America.
- NCCs have been established more recently in African, South-East Asian, European, and Western Pacific Regions.
- Most NCCs are affiliated with naturopathic educational programs.
- NCCs increase accessibility to naturopathic primary care for diverse populations.

Naturopathic care is provided using a variety of models that vary depending on the country, regulation, availability of insurance coverage and funding sources. For the underprivileged, marginalized, low income, and underserved populations or other specialized groups, community clinics (also known as community health centres) provide free or low-cost healthcare services and play a key role in providing necessary primary healthcare that is accessible, culturally competent and person-centered [1]. The World Naturopathic Federation (WNF) undertook a survey in 2020 to map the landscape of naturopathic community clinics (NCCs) around the world. These results are an abridged version of the paper *Naturopathic community clinics: an international cross-sectional survey* published in BMC Health Services Research [2].

Implications

The findings from the WNF's 2020 survey of NCCs align with other research examining characteristics of naturopathic practice [1, 3, 4]. The NCCs appear to serve patients across a broad range of ages (covering nearly all ages), genders (including transgender and non-binary) and culturally diverse groups. Naturopaths/naturopathic doctors treat patients with a broad range of conditions with an emphasis on the gastrointestinal, mental health, endocrine and musculoskeletal conditions and patients seeking general health and wellbeing [1, 3, 4].

Additionally, the treatments being used in NCCs correspond with other research on international

naturopathic practice with an emphasis on dietary advice (applied nutrition), lifestyle counselling, exercise advice, nutritional supplements (clinical nutrition) and herbal medicines [3, 4]. The results indicate the most common consultation model used in NCCs is a one-on-one model including a longer initial appointment (approximately 60 minutes) followed by shorter follow-up appointments (approximately 20-0-30 minutes) [2]. This is in line with other reports highlighting the longer nature of naturopathic consultations) [4, 5]. However, 20% of NCCs are reported to employ group consultations (in addition to one-on-one) – a model not often utilized in general naturopathic practice but becoming more common with medical and other integrative medicine practitioners for reaching diverse and underserved communities and addressing healthcare disparities [6, 7].

NCCs are reaching underserved, and/or marginalized populations including low-income families; immigrants and refugees; people experiencing homelessness; indigenous peoples; Lesbian, Gay, Bisexual, Transgender, Queer, 2 Spirit, Intersex, Asexual (LGBTQ2SIA); senior citizens and those with substance-use disorders; people living with HIV and AIDS; terminal illness and those patients seeking palliative care; as well as victims of domestic violence. Prior research studies have indicated that those who visit with a naturopath/naturopathic doctor generally are more likely to be female and from middle or upper socio-economic demographics [8]. In comparison, it appears NCCs may be reaching different populations who may not otherwise access the care

typical in a private practice setting.

Despite the demand for NCCs and the diversity in populations served, only 23% of NCCs report receiving government funding, with at least 60% of NCCs funded by donations. The lack of funding combined with demand and diversity in each of NCCs, shows more research is needed to explore suitable and sustainable funding models for naturopathic care in underserved settings [2]. Encouraging expansion of NCCs could have considerable benefits, with one US study suggesting that formally incorporating naturopathic care would reduce the numbers of counties classified as health profession shortage areas by 33-142 nationally [9].

Methods

The study employed a cross-sectional, descriptive design which consisted of an initial short screening survey followed by a 40-item survey covering nine domains: *demographic information, basic information about the NCC (including its affiliation with a naturopathic school and the length of time it has been in operation), patient demographics, funding, consultation models, marketing, conditions and naturopathic therapeutic modalities, practices and treatments offered, inter-professional collaboration and basic information about the individual filling the survey.* The screening survey was sent to all known naturopathic educational institutions and full member organizations of the WNF representing naturopathic professional associations in 35 countries via email and was posted on the WNF social media platforms. Descriptive analysis including frequencies and means was conducted for all survey items.

Results

The screening survey was completed by 37 respondents, with 30 then completing the detailed follow-up survey. Table II.1 outlines the distribution of NCCs by WHO Region. The study found that 51% of the NCCs are in North America where they are affiliated with naturopathic educational institutions which have an average of 6.1 NCCs per institution. Most of the NCCs in North America have been in operation for more than 10 years. More recently naturopathic schools in Africa, Asia and the Western Pacific have also started providing NCCs [2, 10-12]. In some Regions, such as the Western Pacific, private practitioners offer NCCs as a part of their clinic practice (i.e., one day a week or month) [2].

The provision of NCC services has continued to grow substantially in recent years with NCCs being offered as part of naturopathic educational institutions globally, as well as through relief or aid organizations, private practices and independent practitioners [2].

Conditions Treated and Treatments Used

The respondents indicated that on average 56±25% of the patients that visit NCC for naturopathic care did so for chronic complaints or conditions, 27±20% for acute care and 15±10% for general health management. Figure II.1 outlines the frequency that patients present with various health conditions as estimated by the respondents. When asked “how often do the patients visiting the community clinic present with the following complaint/concern”, gastrointestinal complaints were the most common with 93% of respondents selecting “often”. This was followed by mental illness concerns (with 67% of respondents selecting “often”) and endocrine and musculoskeletal complaints (with 60% of respondents selecting “often”). Similar to the international practice survey results [3, 4], patients that seek care in a NCC present with a wide range of conditions. As depicted on Figure 38.1, of the 17 groups of conditions outlined in the survey, 77% of the respondents indicated that patients that visit a NCC presented with at least 10 of them “sometimes” or “often”. Even infectious diseases, which was the complaint that was the least reported, was selecting “often” or “sometimes” by 50% of respondents.

Figure II.2 outlines the rate that treatments are performed, prescribed, suggested, or recommended at the community clinic by the naturopaths/naturopathic doctors (as estimated by the respondents). When asked “how often are the following treatments performed, prescribed, suggested, or recommended within the community clinic by the naturopathic practitioners?” the most common therapeutic modalities recommended ‘often’ were dietary advice (applied nutrition) (93%), lifestyle changes (93%), exercise advice (80%) and nutritional supplements (clinical nutrition) (70%). Herbal/botanical medicine, meditation and/or relaxation exercises, breathing exercises, counselling, massage or other soft tissue technique, acupuncture and physical body work techniques were all indicated as being often prescribed 50% – 67% of the time.

Table II.I: Screening Survey: Respondents offering naturopathic community clinics by WHO Region

WHO Region	Distribution of NCC respondents n (%)	Total NCCs represented n (%)	Average number of NCCs per respondent
Africa	1 (4)	3 (3)	3.0
Asia	2 (7)	9 (9)	4.5
Europe	5 (19)	9 (9)	1.8
Latin America and the Caribbean	4 (15)	13 (14)	3.3
North America	8 (30)	49 (51)	6.1
Western Pacific	7 (26)	13 (14)	1.9
Total	27 (100)	96 (100)	3.6

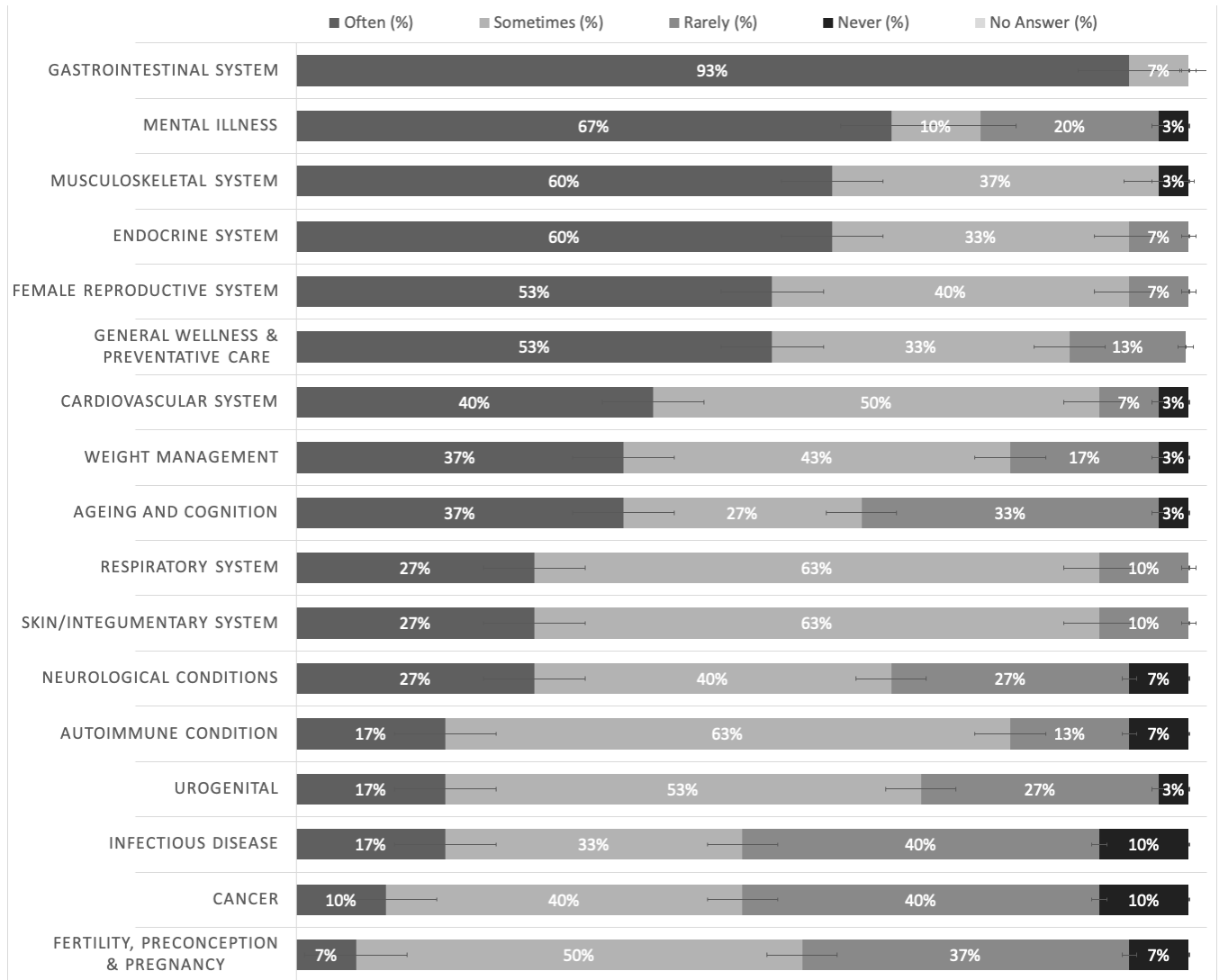


Figure II.I: Conditions patients presented with in naturopathic community clinics

Section 3: Practice and Implementation of Naturopathy in Health Care Systems

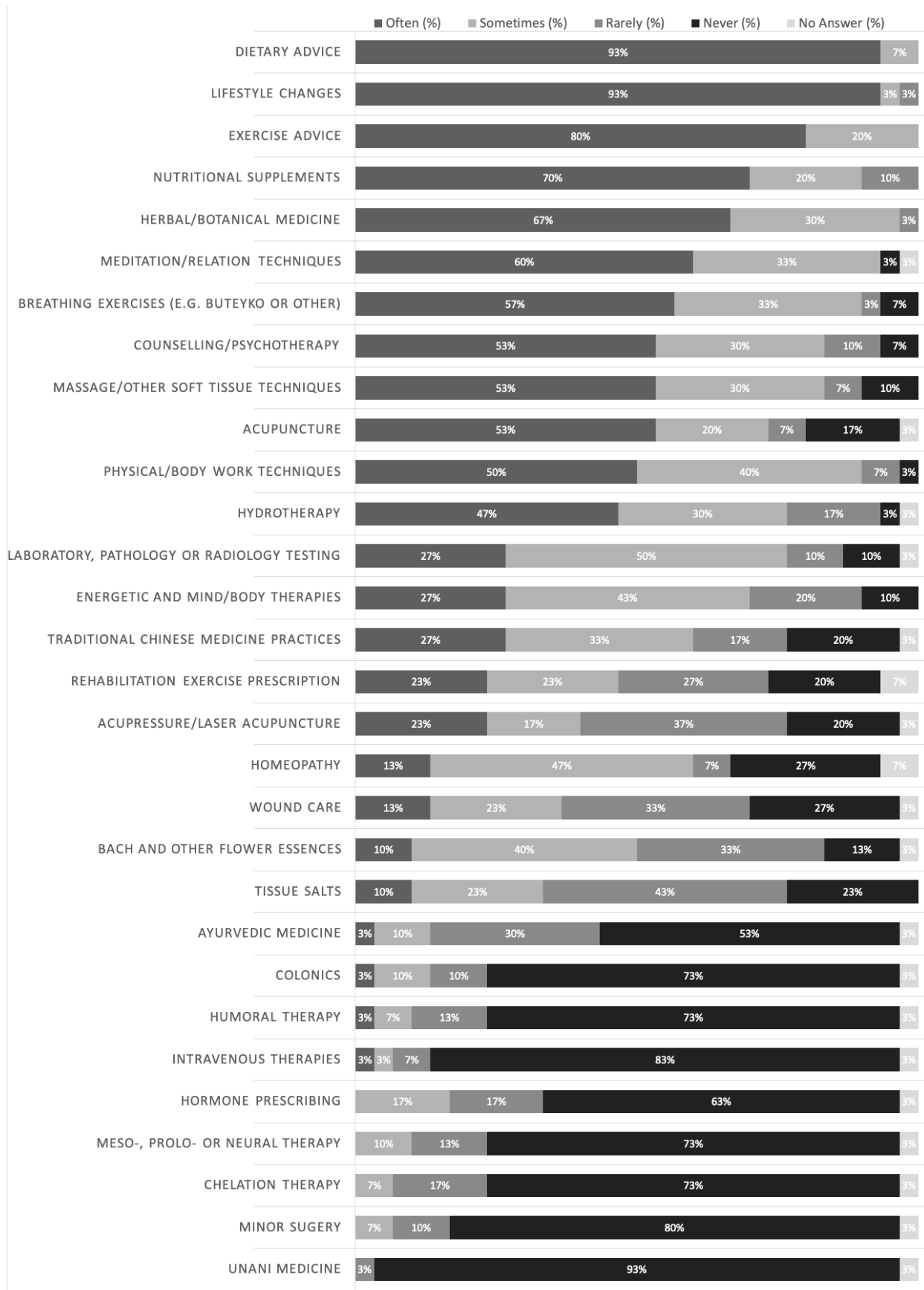


Figure 11.2: Treatments used by naturopaths/naturopathic doctors in naturopathic community clinics

Summary

According to a 2020 survey conducted by the WNF of naturopathic educational institutions, there are over 100 NCCs globally [2] with NCCs having been offered through various naturopathic educational institutions for over three decades [10, 11]. NCCs play an essential role in

serving the underprivileged, marginalized, low income, and underserved populations and other specialized groups. The conditions treated in NCCs, and the therapeutic modalities and naturopathic practices employed are similar to what is seen in general naturopathic clinics. Expanding on the availability and access to NCCs would be beneficial for the naturopathic profession.

Literature Cited

1. National Association of Community Health Centers. *What is a community health center?* 2020; Available from: <https://www.nachc.org/about/about-our-health-centers/what-is-a-health-center/>.
2. Lloyd I, Gerontakos S, and Cardozo V, *Global naturopathic community clinic reach: An international cross-sectional survey*. BMC Health Services Research, 2021.
3. Steel, A., Foley, H., Bradley, R., Van De Venter, C., Lloyd, I., Schloss, J., Wardle, J., and Reid, R., *Overview of international naturopathic practice and patient characteristics: Results from a cross-sectional study in 14 countries*. BMC Complementary Medicine and Therapies, 2020. **20**(1): p. 59.
4. World Naturopathic Federation. *The world naturopathic federation roots report – findings from the naturopathic roots committee survey*. 2016; Available from: <http://worldnaturopathicfederation.org/wnf-publications/>.
5. Foley, H. and Steel, A., *Patient perceptions of clinical care in complementary medicine: A systematic review of the consultation experience*. Patient Education and Counseling, 2017. **100**(2): p. 212-223.
6. Stevens, J.A., Dixon, J., Binns, A., Morgan, B., Richardson, J., and Egger, G., *Shared medical appointments for Aboriginal and Torres Strait Islander men*. Australian Family Physician, 2016. **45**(6): p. 425-9.
7. Thompson-Lastad, A., Gardiner, P., and Chao, M.T., *Integrative group medical visits: A national scoping survey of safety-net clinics*. Health Equity, 2019. **3**(1): p. 1-8.
8. McIntyre, E., Adams, J., Foley, H., Harnett, J., Leach, M.J., Reid, R., Schloss, J., and Steel, A., *Consultations with naturopaths and western herbalists: Prevalence of use and characteristics of users in Australia*. Journal of Alternative and Complementary Medicine, 2019. **25**(2): p. 181-188.
9. Albert, D.P. and Butar, F.B., *Estimating the de-designation of single-county HPSAs in the United States by counting naturopathic physicians as medical doctors*. Applied Geography, 2005. **25**(3): p. 271-285.
10. Canadian College of Naturopathic Medicine. *Clinics*. 2020; Available from: <https://www.ccnm.edu/about-ccnm/clinics>.
11. Bastyr University Clinic. *Community care sites*. 2020; Available from: <https://bastyrclinic.org/about/community-care-sites>.
12. Torrens University Australia. *The practice wellbeing centre Australia*. 2020; Available from: <https://www.torrens.edu.au/en/studying-with-us/why-study-with-us/work-integrated-learning/the-practice-wellbeing-centre>.

12

Community Education and Health Promotion Activities of Naturopaths/Naturopathic Doctors

Amie Steel, ND PhD
Iva Lloyd, ND

HIGHLIGHTS

- Health promotion activities play an important role in addressing non-communicable diseases.
- 98% of naturopaths/NDs engage in community education and health promotion activities.
- Most naturopathic community education activities are free to the public.
- Naturopaths/NDs play an essential role in community-based activities geared towards health promotion and increased community health literacy.

Health promotion and patient education are crucial to improved population health and are also among the core principles that define naturopathy/naturopathic medicine. Health promotion – defined as the process of enabling people to increase control over their health and its determinants, and thereby improve their health [1] – and patient education are reflected in the principles guiding naturopathic practice [2]. The application of these principles as an aspect of naturopathic practice is reported consistently by naturopathic professional organizations around the world [3]. Furthermore, naturopathic practice approaches are reported to encourage positive health behaviours and self-care [4], possibly due to the emphasis naturopaths/naturopathic doctors place on patient-centered care, health promotion and lifestyle counselling [5-7].

This chapter presents the results of an international survey of health promotion and community education behaviours of naturopaths/naturopathic doctors. These results are an abridged version of a paper published in *BMC Complementary Medicine and Therapies* titled, *Community education and health promotion activities of naturopaths/naturopathic doctors: results of an international cross-sectional survey* [8].

Implications

This chapter presents the first known examination of community education activities undertaken by

naturopaths/naturopathic doctors and it identifies several important findings. Firstly, it found most naturopaths/naturopathic doctors engage in activities aimed at educating the community through diverse methods including talks and presentations, social and professional networks, information handouts and traditional media channels. The study also suggests that the behaviour of the naturopathic workforce aligns with recommended health communication practices as they use a range of communication channels to provide health information to the community [9]. One reason for the extent to which naturopaths/naturopathic doctors appear to engage with health promotion and community education is the alignment between these activities and the guiding naturopathic principles [2], which positions health promotion as central to naturopathic practice.

In contrast, other primary care practitioners (i.e. general practitioners and nurses) commonly perceive health promotion activities as educational tasks that are the responsibility of the community or government and therefore, as peripheral to their field of work [10]. This avoidance of health promotion activities among primary care professions has been linked to the biomedical perspective which de-emphasizes social determinants of health, illness prevention and promotion of healthy lifestyles [10]. Health promotion interventions carried out in primary care settings have historically focused on reducing risk factors associated with non-communicable diseases, encouraging physical activity, and

improving self-care in individuals with chronic illness [11]. These topics are all reflected in the topics discussed by the naturopaths/naturopathic doctors included in our study. However, it is notable that other topics such as naturopathic approaches to understanding health and talks on specific naturopathic treatments were also commonly reported and are likely unique to naturopathic practice [12]. Despite these differences, the study suggests naturopaths/naturopathic doctors are engaging in health promotion activities and as such their potential impact on community health should be examined within the broader context of health promotion in primary care practice. Naturopaths/naturopathic doctors employ diverse communication methods to educate the community.

The diversity of education methods employed by naturopaths/naturopathic doctors matches contemporary research regarding health communication [13]. It is particularly important in this context as research has shown that successful modification of health behaviours in the community targets specific populations and employs multiple communication activities and channels [13]. Given one of the most common topics reported by our study participants related to changing health behaviours to improve health, the varied approaches employed by naturopaths/naturopathic doctors to educate individuals in their community may improve the success of their efforts. This may be further supported by naturopaths/naturopathic doctors sharing knowledge developed through consideration of the patient's unique needs, as has been reported by other survey research involving the global naturopathic profession [14, 15] (see Chapters 9 and 13). Further, individuals who visit with a naturopath/naturopathic doctor may be more motivated to engage in positive health behaviours [11]. This combination of patient-centered education and a motivated patient group may mean the community education activities undertaken by naturopaths/naturopathic doctors have a marked impact in their patient population compared to health promotion initiatives targeting other members of the community.

Methods

The 15-item survey was offered in five languages (English, Spanish, French, Portuguese and Slovene) and covered four domains: *demographics and practice characteristics, community education activities, community education topics and populations, and planning and designing community education activities*. Participants were recruited via World Naturopathic Federation full member organizations, representing naturopathic professional associations in 35 countries. Descriptive analysis was conducted for all survey items, with frequencies and percentages calculated for categorical data and mean and standard deviation calculated for continuous data.

Results

The survey was completed by 813 naturopaths/naturopathic doctors with representation from all WHO Regions. The naturopathic practitioners that participated were predominantly female (77.5%) with 16.3% having qualified as a naturopath/naturopathic doctor more than 20 years ago and approximately one third of participants (31.3%) having received their first naturopathic qualification less than five years ago. The majority (83.0%) of respondents reported currently being in clinical practice, of whom 38.8% were in clinical practice on their own and 22.9% were co-located with other health professionals but not other naturopaths/naturopathic doctors and 22.2% indicated that they practiced in a multi-disciplinary clinic with other naturopaths/naturopathic doctors and other healthcare providers. Over half of all participating naturopaths/naturopathic doctors reported that they either provide home visit consultations (30.3%) or free consultations for specific patient populations (23.1%).

Almost all participants (98%) reported at least one community education activity. Most commonly reported were information sheets and handouts (92.7%), social and professional network communications (91.8%) and information talks presented to the community (84.9%), while traditional media channels were reported less frequently (52.8%). Naturopaths/naturopathic doctors most targeted their community education activities towards the general population (77.8%) and discussed naturopathic approaches to understanding health (72.1%) and effective ways to change health behaviours for improved health (69.9%). Further details of the community education activities undertaken by participants are presented in Table 12.1.

A substantial proportion of participants reported giving either individualized (84.5%) or pre-prepared information handouts (81.4%) directly to patients as part of consultations; or using social media (84.6%) to educate their community. Most users reported undertaking these activities daily, weekly, or monthly. Guest talks with community or patient-support groups (no fee charged to attendees) were also reported by many participants (72.4%) but were more commonly reported to occur every few months or less.

Participating naturopaths/naturopathic doctors reported contributing invited expert comments for newspaper and magazine articles (41.1%), with most of those respondents indicating this occurred less than once per year (35.8%). The topics covered by participants' community education activities included effective ways to change behaviours for improved health (69.9%), self-care (69.3%), managing current health issues (65.6%) and preventing future health issues (65.5%).

Table 12.1: Community education and health promotion activities undertaken by naturopathic practitioners

Community education/health promotion activity	Yes N (%)	Frequency					
		Daily N (%)	Weekly N (%)	Monthly N (%)	Every few months N (%)	1 or 2 / year N (%)	< 1 / year N (%)
Talks and presentations							
<i>Guest talks with community or patient-support groups (no fee charged to attendees) (n=739)</i>	535 (72.4)	33 (6.2)	47 (8.8)	70 (13.1)	132 (24.7)	136 (25.4)	117 (21.9)
<i>Guest talks with community or patient-support groups (fee charged to attendees) (n=732)</i>	412 (56.3)	37 (9.0)	40 (9.7)	49 (11.9)	78 (18.9)	109 (26.5)	99 (24.0)
<i>Talks presented to the community and held within your clinic (no fee charged to attendees) (n=728)</i>	388 (53.3)	14 (3.6)	26 (6.7)	46 (11.9)	78 (20.1)	108 (27.8)	116 (29.9)
<i>Talks presented to the community and held within your clinic (fee charged to attendees) (n=724)</i>	290 (40.1)	14 (4.8)	24 (8.3)	38 (13.1)	61 (21.0)	77 (26.6)	76 (26.2)
<i>Online seminars or workshops (no fee charged to attendees) (n=716)</i>	301 (42.0)	13 (4.3)	23 (7.6)	62 (20.6)	73 (24.3)	64 (21.3)	66 (21.9)
<i>Online seminars or workshops (fee charged to attendees) (n=708)</i>	268 (37.9)	7 (2.6)	30 (11.2)	33 (12.3)	58 (21.6)	61 (22.8)	79 (29.5)
Communication through social and professional networks							
<i>Social media (e.g., Facebook, Instagram, Twitter) (n=728)</i>	616 (84.6)	169 (27.4)	219 (35.6)	99 (16.1)	71 (11.5)	32 (5.2)	26 (4.2)
<i>Blogs (n=725)</i>	422 (58.2)	24 (5.7)	85 (20.1)	113 (26.8)	103 (24.4)	57 (13.5)	40 (9.5)
<i>Email newsletter (n=722)</i>	418 (57.9)	14 (3.4)	45 (10.8)	137 (32.8)	103 (24.6)	63 (15.1)	56 (13.4)
<i>Vlog (e.g., YouTube channel) (n=718)</i>	208 (29.0)	10 (4.8)	32 (15.4)	37 (17.8)	55 (26.4)	28 (13.5)	46 (22.1)
<i>Invited expert comment on a podcast (n=722)</i>	160 (22.2)	1 (0.6)	10 (6.3)	14 (8.8)	33 (20.6)	37 (23.1)	65 (40.6)
<i>Print newsletter (n=719)</i>	136 (18.9)	7 (5.2)	10 (7.4)	28 (20.6)	21 (15.4)	30 (22.1)	40 (29.4)
<i>Regular segment on a podcast (n=720)</i>	72 (10.0)	2 (2.8)	11 (15.3)	13 (18.1)	12 (16.7)	15 (20.8)	19 (26.4)
Information handouts							
<i>Individualized handouts given directly to patients as part of the consultation (n=729)</i>	616 (84.5)	334 (54.2)	150 (24.4)	60 (9.7)	39 (6.3)	13 (2.1)	20 (3.3)
<i>Pre-prepared handouts given directly to patients as part of the consultation (n=722)</i>	588 (81.4)	245 (41.7)	181 (30.8)	63 (10.7)	56 (9.5)	23 (3.9)	20 (3.4)
<i>Information handouts in the clinic waiting room (n=729)</i>	502 (68.9)	181 (36.1)	70 (13.9)	84 (16.7)	71 (14.1)	47 (9.4)	49 (9.8)
<i>Information handouts available for download from your website (n=723)</i>	285 (39.4)	93 (32.6)	36 (12.6)	57 (20.0)	46 (16.1)	20 (7.0)	33 (11.6)
Traditional media channels							
<i>Invited expert comment for newspaper or magazine articles (n=721)</i>	296 (41.1)	7 (2.4)	15 (5.1)	28 (9.5)	65 (22.0)	75 (25.3)	106 (35.8)
<i>Regular column in newspaper or magazine (n=720)</i>	135 (18.8)	4 (3.0)	8 (6.0)	30 (22.2)	23 (17.1)	19 (14.1)	51 (37.8)
<i>Invited expert comment on a radio program (n=722)</i>	209 (29.0)	2 (1.0)	11 (5.3)	16 (7.7)	30 (14.4)	45 (21.5)	105 (50.2)
<i>Regular segment on a radio program (n=720)</i>	87 (12.1)	4 (4.6)	11 (12.6)	10 (11.5)	15 (17.2)	15 (17.2)	32 (36.8)
<i>Invited expert comment on a television program (n=723)</i>	124 (17.2)	1 (0.8)	7 (5.7)	5 (4.0)	17 (13.7)	22 (17.7)	72 (58.1)
<i>Regular segment on a television program (n=716)</i>	38 (5.3)	2 (5.3)	5 (13.2)	3 (7.9)	9 (23.7)	4 (10.5)	15 (39.5)

The activities were mostly aimed at the general population (77.8%) although several participants also reported targeting populations based on sociodemographic factors such as life stage (infants and children [23.7%], elderly [21.3%]) or income level (low income [21.5%]). Community education activities were reported as being disease-specific by 22.7% of participants. The topic focus for these activities was most reported as endocrine (25.4%) and autoimmune or allergy conditions (21.1%). Most participants indicated that the health issues that individuals in their community said they need help with (79.5%) and expert advice and evidence about the health issues affecting the community (77.4%) were particularly important considerations when identifying the need for their community education activities.

Summary

An international survey of health promotion and community education behaviours of naturopaths/NDs indicates that the majority of naturopaths/naturopathic doctors engage in activities aimed at educating the community through diverse methods including talks and presentations, social and professional networks, information handouts and traditional media channels. The most common health promotion and community education activities reported were information sheets and handouts, social and professional network communications and information talks presented to the community. Naturopaths/naturopathic doctors most targeted their community education activities towards the general population and discussed naturopathic approaches to understanding health and effective ways to change health behaviours for improved health.

Literature Cited

1. World Health Organisation, *The Bangkok Charter for Health Promotion in a Globalized World*. 2005, WHO: Geneva, Switzerland.
2. Hausser, T., Lloyd, I., Yánez, J., Cottingham, P., Newman-Turner, R., and Abascal, A. *WNF White Paper: Naturopathic Philosophies, Principles and Theories*. 2017; Available from: <http://worldnaturopathicfederation.org/wp-content/uploads/2015/12/White-Paper-FINAL.pdf>.
3. World Naturopathic Federation Roots Committee. *WNF – Naturopathic Roots Report*. 2016; Available from: http://worldnaturopathicfederation.org/wp-content/uploads/2015/12/Naturopathic-Roots_final-1.pdf.
4. Bradley, R., Sherman, K.J., Catz, S., Calabrese, C., Oberg, E.B., Jordan, L., Grothaus, L., and Cherkin, D., *Adjunctive naturopathic care for type 2 diabetes: patient-reported and clinical outcomes after one year*. *BMC Complementary and Alternative Medicine*, 2012. **12**(1): p. 44.
5. Oberg, E.B., Bradley, R., Hsu, C., Sherman, K.J., Catz, S., Calabrese, C., and Cherkin, D.C., *Patient-Reported Experiences with First-Time Naturopathic Care for Type 2 Diabetes*. *PloS one*, 2012. **7**(11): p. e48549.
6. Foley, H. and Steel, A., *Patient perceptions of patient-centred care, empathy and empowerment in complementary medicine clinical practice: A cross-sectional study*. *Advances in Integrative Medicine*, 2017. **4**: p. 22-30.
7. Foley, H., Steel, A., and Adams, J., *Perceptions of Person-Centred Care Amongst Individuals with Chronic Conditions who Consult Complementary Medicine Practitioners*. *Complementary Therapies in Medicine*, 2020: p. 102518.
8. Steel, A. and Lloyd, I., *Community education and health promotion activities of naturopathic practitioners: results of an international cross-sectional survey*. *BMC Complementary Medicine and Therapies*, 2021.
9. Kreps, G.L., *Evaluating health communication programs to enhance health care and health promotion*. *Journal of Health Communication*, 2014. **19**(12): p. 1449-1459.
10. Rubio-Valera, M., Pons-Vigués, M., Martínez-Andrés, M., Moreno-Peral, P., Berenguera, A., and Fernández, A., *Barriers and Facilitators for the Implementation of Primary Prevention and Health Promotion Activities in Primary Care: A Synthesis through Meta-Ethnography*. *PLoS One*, 2014. **9**(2): p. e89554.
11. Bradley, R., Sherman, K.J., Catz, S., Calabrese, C., Jordan, L., Grothaus, L., and Cherkin, D.C., *Survey of CAM interest, self-care, and satisfaction with health care for type 2 diabetes at group health cooperative*. *BMC Complementary and Alternative Medicine*, 2011. **11**(1): p. 121.
12. Steel, A., Foley, H., Bradley, R., Van De Venter, C., Lloyd, I., Schloss, J., Wardle, J., and Reid, R., *Overview of international naturopathic practice and patient characteristics: results from a cross-sectional study in 14 countries*. *BMC Complementary Medicine and Therapies*, 2020. **20**(1): p. 59.
13. Snyder, L.B., *Health communication campaigns and their impact on behavior*. *Journal of Nutrition Education and Behavior*, 2007. **39**(2): p. S32-S40.
14. Steel, A., Foley, H., D Souza, J., Adams, J., and Wardle, J., *Knowledge dissemination by the naturopathic profession: a bibliometric analysis of naturopath-authored, peer-reviewed publications*. *The Journal of Alternative and Complementary Medicine*, 2021. **In press**.
15. Steel, A., Leach, M., Brosnan C, Ward V, and Lloyd, I., *Naturopaths' mobilization of knowledge and information in clinical practice: an international cross-sectional survey*. *BMC Complementary Medicine and Therapies*, 2021.

13 Mobilization of Knowledge and Information in Naturopathic Clinical Practice

Amie Steel, ND PhD
Matthew Leach, ND PhD
Caragh Brosnan, PhD

Vicky Ward, PhD
Iva Lloyd, ND

HIGHLIGHTS

- Naturopaths/NDs use and share knowledge and information from diverse sources, including scientific journals, clinical textbooks, conferences, and patients.
- 76.2% of naturopaths/NDs report using information published in scientific journals to inform patient care.
- 70.1% of naturopaths/NDs report using information from laboratory, and pathology tests or radiological examinations to inform patient care.
- Naturopaths/NDs also use patient-provided information, particularly the patient's lived experience of their health condition, to inform their clinical decisions 64.6% of the time.
- Naturopaths/NDs demonstrate application of both evidence-based medicine and patient-centred care principles when they use and apply knowledge and information.

Evidence-based practice (EBP) is an important component of contemporary clinical decision making and is integral to the provision of quality health care. The contemporary EBP model acknowledges the importance of patient preferences, clinician experience and relevant scientific studies when applying evidence within a clinical setting [1]. Implicit within EBP is knowledge translation, a process whereby knowledge – primarily research evidence – is synthesized, exchanged and applied by relevant stakeholders [2] including, but not limited to, health practitioners. Knowledge mobilization acknowledges the complexities of knowledge translation by recognizing and respecting diversity in the types of knowledge, and realizing how such diversity can influence health care and health care choices [3].

In 2020 the World Naturopathic Federation (WNF) surveyed the international naturopathic profession with the aim of examining naturopathic practitioners' approach to sharing and using knowledge and information related to clinical practice. These results are an abridged version of a paper titled *Naturopaths' mobilisation of knowledge and information in clinical practice: an international cross-sectional survey*, published in *BMC Complementary Medicine and Therapies* [4].

Implications

The results of the survey presented in this chapter highlight the variety and complexity of information and knowledge sources naturopaths/naturopathic doctors use and share to inform their clinical practice. Previous qualitative research suggests that while naturopaths/naturopathic doctors might use evidence-based procedures in the same way as other professions, they may be less likely to refer to the concept of EBP [5]. The findings from this survey indicate that naturopaths/naturopathic doctors use an average of seven information sources to inform patient care means that the EBP framework – in which published evidence, clinical experience and patient preference are triangulated [1] – accounts for only a portion of the knowledge translation process taking place. Instead, consistent with knowledge mobilization [3], naturopaths/naturopathic doctors are drawing on and influenced by diverse information sources, including the patient experience.

Among the information sources used to inform care, information published in scientific journals was the most widely used. This finding departs from earlier research

reporting that complementary medicine practitioners prefer traditional knowledge and textbooks [6, 7]. The difference may reflect a change over time and higher uptake of EBP, or that naturopaths/naturopathic doctors are more likely to apply evidence from journals than other complementary medicine practitioners studied. However, further research is needed to understand how naturopaths/naturopathic doctors are engaging with journal publications and applying the information, given previous findings that many have limited access to full-text journals [8]. It is worth noting, however, that nearly a quarter of respondents do not use information from scientific journals to inform patient care, suggesting that the uptake of research findings may still be limited compared with what has been observed for other health professions [7, 9]. Previous research suggests the barriers to naturopaths/naturopathic doctors using published research to inform their clinical practice include poor transferability of new knowledge from research due to misalignment between the design of interventions and routine daily naturopathic practice [10] and poor access to full-text articles or limited research appraisal skills [8].

Conferences and professional events were frequently used as information sources. However other qualitative research suggests that information derived from these sources may be viewed with some wariness by the naturopaths/naturopathic doctors, particularly if they are provided by product manufacturers [8]. Information provided by product companies was among the least frequently used by naturopaths/naturopathic doctors [11]. Modern clinical textbooks were also an important resource for respondents. Previous research has found that naturopathic practitioners use modern clinical textbooks to locate specific information such as drug interactions and pathophysiology of health conditions [8]. Traditional textbooks were used less frequently but still used by a significant minority to inform clinical decisions and determine how a treatment might benefit a patient. It is also interesting to note that naturopathic practitioners frequently use laboratory test results to inform care.

Patients are a source of information for more than two-thirds of participants and the information source that was reported as used ‘always’ by the highest proportion of users. Prior qualitative research reports that naturopaths/naturopathic doctors see comprehensive case history-taking as crucial in understanding patients’ experience of symptoms [5]. Our study supports this through the finding that patients’ personal health histories are shared with most practitioners, always or most of the time. Over and above the patient’s history, however, is the patient’s perspective of living with the condition, which was the form of knowledge patients most often shared with practitioners in our study. The role of this less structured, more experiential knowledge has largely been excluded from formulations of EBP, where the patient perspective is typically reduced to the patient’s

preference among a set of discreet choices presented by the clinician [12]. While the clinician’s experience is explicitly included in EBP, the patient’s experience is not [1]. Indeed, in the evidence hierarchy, patients’ individual experiences are framed as anecdotal, positioning them at the bottom [12]. In contrast, Greenhalgh et al. argue that ‘the richness of narrative’ – that is, listening to the patient’s story – is essential information required to appropriately tailor research-based treatment to an individual case [12].

Methods

The online, international cross-sectional survey sampled naturopaths/naturopathic doctors that were either currently in clinical practice or had been in practice within the last 12 months. This included naturopaths/naturopathic doctors on temporary leave from practice due to government restrictions resulting from the COVID-19 pandemic (relevant based on the timing of the survey) or personal leave (e.g., parental leave), if the period of leave did not exceed 12 consecutive months. Participants were recruited via the WNF and its member organizations. The survey was administered in five languages (English, French, Portuguese, Spanish and German). The instrument included 122 core questions and an additional six adaptive questions, which were repeated up to nine times dependent on the number of items selected in one survey item (“Which of the following types of information sources do you employ when providing care to patients?”).

Results

Of the 548 respondents, the average age was 45.9 years old with 73.2% being female. All WHO Regions were represented with the greatest proportion of respondents located in North America (36.8%) and Western Pacific (23.2%). Approximately half (49.8%) of participants reported that they had been in practice between 5 and 10 years and more than one-third (37.2%) reported practicing in a clinic by themselves as their primary location of practice. Participants most reported using information published in scientific journals by researchers (76.2%) to inform the care provided to their patients (see Table 13.1). Two-thirds (64.6%) of participants also indicated they used information provided by the patient and the majority (81.7%) of the participants that use patient-provided information indicated they ‘always’ do so. Information from conferences and other professional events (74.1%) and information published in modern naturopathic clinical textbooks (70.7%) were also selected by most participants, and most reported as being used ‘sometimes’ (conferences: 30.8%; modern naturopathic textbooks: 34.5%). Overall, participants reported using an average of seven (SD=2.6) information sources to inform patient care.

Table 13.1: Frequency of Information sources used by naturopathic practitioners to inform patient care

Information source used by naturopathic practitioner to inform patient care (n=478)	n (%)	Frequency of use				
		Always	Most of the time	About half the time	Sometimes	Never
Information published in scientific journals by researchers	364 (76.2)	68 (19.2)	157 (44.4)	66 (18.6)	62 (17.5)	1 (0.3)
Information gathered from conferences or other professional events	354 (74.1)	31 (10.2)	87 (28.5)	92 (30.2)	94 (30.8)	1 (0.3)
Information published in modern naturopathic clinical textbooks (published in the last 10 years)	338 (70.7)	27 (9.0)	95 (31.8)	71 (23.8)	103 (34.5)	3 (1.0)
Information from laboratory tests, pathology, or radiology tests	335 (70.1)	78 (27.7)	110 (39.0)	50 (17.7)	44 (15.6)	0 (0.0)
Information published in professional journals for clinicians	333 (69.7)	31 (9.9)	115 (36.9)	81 (26.0)	83 (26.6)	2 (0.6)
Information provided by the patient	309 (64.6)	205 (81.7)	26 (10.4)	9 (3.6)	11 (4.4)	0 (0.0)
Information published in general clinical textbooks	296 (61.9)	24 (8.9)	87 (32.1)	59 (21.8)	100 (36.9)	1 (0.4)
Information from clinical guidelines	248 (51.9)	24 (12.2)	85 (43.2)	31 (15.7)	54 (27.4)	3 (1.5)
Information provided by product companies	230 (48.1)	7 (3.5)	43 (21.5)	51 (25.5)	99 (49.5)	0 (0.0)
Information published in traditional naturopathic clinical textbooks (published more than 50 years ago)	193 (40.4)	6 (3.5)	46 (27.1)	24 (14.1)	87 (51.2)	7 (4.1)

The knowledge types reported by participants as used to inform patient care included knowledge developed through clinical experience (86.2%), initial clinical training (81.2%), continuing professional education delivered by an expert clinician (79.9%), consideration of the patient's unique needs (78.7%) and discussions with professional peers (75.7%) (see Table 13.2). Less common knowledge types used by participants were knowledge developed through continuing professional education delivered by a researcher (59.8%) and through discussions

with a mentor or expert (55.4%). The patient's perspectives of living with their health condition (Always: 49.1%; Most of the time: 40.2%) and the patient's personal health history (Always: 44.9%; Most of the time: 34.1%) were most identified as frequently used knowledge or information sources shared by the patient. The patient's family health history and conventional medical examinations or tests were also commonly reported, although not as frequently.

Table 13.2: Frequency of source of knowledge and information shared by patients with naturopathic practitioners

Source of knowledge or information shared by patients with their naturopathic practitioner	Always	Most of the time	About half the time	Sometimes	Never
Patient's perspective of living with their condition (n=371)	182 (49.1)	149 (40.2)	27 (7.3)	13 (3.5)	0 (0.0)
Patient's personal health history (n=371)	166 (44.9)	126 (34.1)	47 (12.7)	29 (7.8)	2 (0.5)
Patient's family health history (n=371)	101 (27.2)	152 (41.0)	54 (14.5)	62 (16.7)	2 (0.5)
Conventional medical examinations or tests (n=371)	77 (20.8)	164 (44.2)	75 (20.2)	51 (13.8)	7 (1.1)
Functional examinations or tests (e.g., urine/salivary hormone tests (n=369)	48 (13.0)	77 (20.9)	78 (21.1)	154 (41.7)	12 (3.3)
General internet sources (e.g., blogs, social media) (n=370)	36 (9.7)	154 (41.6)	93 (25.2)	79 (21.4)	8 (2.2)
Other health professionals involved in their care (n=371)	21 (5.7)	107 (28.8)	115 (31.0)	125 (33.7)	3 (0.8)

Informal sources (e.g., family and friends) (n=371)	20 (5.4)	83 (22.4)	113 (30.5)	144 (38.8)	11 (3.0)
Books (n=371)	9 (2.4)	46 (12.4)	71 (19.2)	229 (61.7)	16 (4.3)
Broadcast media (e.g., TV, radio) (n=370)	12 (3.2)	63 (17.0)	64 (17.3)	196 (53.0)	35 (9.5)
Research organizations (n=368)	5 (1.4)	10 (2.7)	8 (2.2)	208 (56.5)	137 (37.2)
Patient advocacy or support groups (n=371)	4 (1.1)	13 (3.5)	32 (8.6)	219 (59.0)	103 (27.8)
Government agencies (n=369)	1 (0.3)	9 (2.4)	23 (6.2)	217 (58.8)	119 (32.3)
Published journal articles (n=371)	1 (0.3)	19 (5.1)	13 (3.5)	217 (58.5)	121 (32.6)

Summary

This study found naturopaths/naturopathic doctors draw knowledge from a diverse range of information sources. While published research evidence is prominent among them, they also draw on traditional knowledge, clinical experience, and patient expertise regarding their own health condition. Naturopaths/naturopathic doctors also appear to be active in sharing their knowledge with patients and the wider community. Based on these findings, it may be argued that naturopaths/naturopathic doctors practice knowledge mobilization, employing multiple forms and sources of knowledge, and mobilizing knowledge to – as well as from – others. This is further evident through the work of the global naturopathic

community in synthesizing existing research evidence through systematic reviews and meta-analyses (see Chapters 16, Chapter 28, Chapter 40, and Appendix II). A notable example of such efforts can be seen through a series of rapid reviews focused on naturopathic treatments for acute upper respiratory viral infections, undertaken in response to the global COVID-19 pandemic by an international team of naturopathic researchers [13]. The knowledge produced through these reviews has reached community, research and policy audiences [14]. Given such examples of the naturopathic profession's active engagement in patient and community education, naturopaths/naturopathic doctors may be considered knowledge brokers – a role for which they are under-utilized at present.

Literature Cited

1. Sackett, D.L., Rosenberg, W.M., Gray, J.M., Haynes, R.B., and Richardson, W.S., *Evidence based medicine: what it is and what it isn't*. 1996, British Medical Journal Publishing Group.
2. World Health Organisation, *Meeting on Knowledge Translation in Global Health*. 2006, World Health Organisation: Geneva. p. 10-12.
3. Cooper, A. and Levin, B., *Some Canadian contributions to understanding knowledge mobilisation*. Evidence & Policy: A Journal of Research, Debate and Practice, 2010. 6(3): p. 351-369.
4. Steel, A., Leach, M., Brosnan C, Ward V, and Lloyd, I., *Naturopaths' mobilization of knowledge and information in clinical practice: an international cross-sectional survey*. BMC Complementary Medicine and Therapies, 2021.
5. Barnes, L. and Grace, S., *The dietetics and naturopathy professions: perceptions of role boundaries*. Health Sociology Review, 2019. 28(1): p. 85-102.
6. Leach, M.J. and Gillham, D., *Are complementary medicine practitioners implementing evidence based practice?* Complementary Therapies in Medicine, 2011. 19(3): p. 128-136.
7. Suter, E., Vanderheyden, L.C., Trojan, L.S., Verhoef, M.J., and Armitage, G.D., *How important is research-based practice to chiropractors and massage therapists?* Journal of Manipulative and Physiological Therapeutics, 2007. 30(2): p. 109-115.
8. Steel, A. and Adams, J., *The application and value of information sources in clinical practice: an examination of the perspective of naturopaths*. Health Information and Libraries Journal, 2011. 28(2): p. 110-118.
9. McCaughan, D., Thompson, C., Cullum, N., Sheldon, T., and Raynor, P., *Nurse practitioner and practice nurses' use of research information in clinical decision making: findings from an exploratory study*. Family Practice, 2005. 22(5): p. 490-497.
10. Steel, A. and Adams, J., *The interface between tradition and science: naturopath's perspective of modern practice*. Journal of Alternative and Complementary Medicine, 2011.

- 17(10): p. 967-72.
11. Braun, L.A., Spitzer, O., Tiralongo, E., Wilkinson, J.M., Bailey, M., Poole, S.G., and Dooley, M., *Naturopaths and Western herbalists' attitudes to evidence, regulation, information sources and knowledge about popular complementary medicines*. *Complementary Therapies in Medicine*, 2013. **21**(1): p. 58-64.
 12. Greenhalgh, T., Snow, R., Ryan, S., Rees, S., and Salisbury, H., *Six 'biases' against patients and carers in evidence-based medicine*. *BMC medicine*, 2015. **13**(1): p. 1-11.
 13. Steel, A., Wardle, J., and Lloyd, I., *The potential contribution of traditional, complementary and integrative treatments in acute viral respiratory tract infections: Rapid Reviews in response to the COVID-19 pandemic*. *Advances in Integrative Medicine*, 2020. **7**(4): p. 181.
 14. Steel, A. *WNF Report: Impact of Our Rapid Reviews*. 2021; Available from: http://worldnaturopathicfederation.org/wp-content/uploads/2021/03/WNF-Report_Impact-of-Rapid-Reviews.pdf.