

The 6th Annual CCNM Research Day: Student Research & Innovation in Naturopathic Medicine



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Abstract

The following are abstracts from the research competition at the 6th annual CCNM Research Day hosted virtually by the Canadian College of Naturopathic Medicine in New Westminster, BC, Canada and Toronto, ON, Canada. The conference celebrates high quality student-faculty research collaborations, showcased as poster presentations.

Keywords

naturopathy; research; naturopathic medicine; complementary medicine; integrative medicine; natural health products, undergraduate research competition; innovation; mentors

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Conference Abstracts

Note: These abstracts have been reproduced directly from the material supplied by the authors, without editorial alteration by the staff of the URNCST Journal. Insufficiencies of preparation, grammar, spelling, style, syntax, and usage are the authors.

Design and evaluation of an evidence-based practice continuing education course for Canadian naturopathic doctors

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Background: Evidence-based practice (EBP) involves the combination of best scientific evidence with clinician expertise and patient preference in an effort to optimize the quality of patient care. Findings from a recent survey indicate Canadian Naturopathic Doctors (NDs) use evidence frequently in their clinical practice. However, opportunities for improvement still exist; particularly in the area of skills development. The primary objective of the present project was to assess the feasibility and acceptability of delivering a co-designed EBP continuing education (CE) course to Canadian NDs. Secondary objectives included assessing changes in EBP knowledge, use and attitudes.

Methods: Phase 1 of this project was the co-design of an EBP CE course. Through a series of three focus groups, Canadian NDs were queried about their EBP training needs and preferences. The results were combined with best practices in EBP education to create a course. In Phase 2, the 5-week virtual CE course was delivered and evaluated. Participants reported on their level of satisfaction and provided suggestions for improvement. EBP knowledge, attitudes and use were assessed before and after participation using the validated EBASE instrument.

Results: Twenty-two Canadian NDs participated in Phase 1. Participants expressed a high level of interest in the course and in learning about core EBP skills. An emerging theme was the need to balance scientific evidence with other factors, such as naturopathic principles and philosophy. In Phase 2, 81 NDs enrolled in the course and 61 (75%) completed at least one assessment. Eighty-nine percent of participants agreed or strongly agreed that they were satisfied with the course. There was a significant increase in self-reported skill and objectively measured EBP knowledge; there was no substantive change in EBP attitudes or use of evidence. Because of varying baseline knowledge, participants suggested that the course could be delivered at basic, intermediate, and advanced levels.

Conclusions: Co-design and delivery of an EBP CE course to Canadian NDs was feasible and acceptable. Preliminary evidence suggests that participation in the course was associated with improved EBP knowledge. Participants provided actionable suggestions to improve the course in future iterations.

Funding Sources: No funding was received for the conduct of this research.

Conflict of Interest: The authors declare no conflict of interest.

What does planetary health mean to health care practitioners? A protocol for a cross-sectional analysis

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Background: Planetary health is a significant determinant of individual and population health; healthcare providers (HCPs) have a responsibility to promote and steward planetary health. Barna et al have outlined objectives that may provide a framework for incorporating principles of planetary health into health professions education, a domain that has thus far not been integral to the training of many practicing HCPs. Medical education tends to be dominated by Eurocentric, reductionistic worldviews. The lens of planetary health seeks to counter these frameworks, decolonize healthcare, and center sustainability and humility in healthcare practice.

Objective: In order to understand how best to support HCPs in building the capacity to promote planetary health, we seek to assess existing values, knowledge, and skills of a global cross-section of HCPs.

Methods: We designed a survey informed by the “Canmore Declaration of Principles for Planetary Health,” and the “Declaration Calling for Clinicians of the World to Act on Planetary Health” to assess knowledge, attitudes and practices of a broad spectrum of HCPs with respect to planetary health. The tool also aims to identify the challenges HCPs experience incorporating planetary health principles in their professional practice. In this poster we share our survey tool, methodology, and a mechanism that we used to solicit feedback from HCPs engaged in planetary health promotion to improve the quality of our process.

Conclusion: We hope that our project will elucidate the current state of affairs with HCPs and planetary health, and that obstacles identified could lead to further initiatives that could have a strong and tangible impact on planet-centered health care.

Funding Sources: No funding was received for the conduct of this research.

Conflict of Interest: The authors declare no conflict of interest.

Adaptations to the Mediterranean diet that address culturally relevant food choices

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Background: The Mediterranean Diet (MD) has been studied for its benefits in metabolic risk factors since the 1950s. In recent years, debates around barriers to access within cultural, socioeconomic, and environmental fields have arisen within non-Eurocentric cultural backgrounds. Using data on the effects of dietary components with health benefits, this review will produce a map of MD modifications to match various cultures.

Methods: Foods and constituents of the MD were compared and analyzed to assess benefits for both healthy and metabolic disease states using both empirical and theoretical approaches. Databases (PubMed and Cochrane) were searched using terms for cultural diets (eg. “standard American diet,” “Mediterranean diet,” “Japanese diet”) and metabolic disease outcomes associated with the MD (eg. HbA1C, cholesterol, waist circumference, weight, AST and ALT). A cultural affinity diet database (*Oldways*, n.d.) was used to identify culturally-specific foods that match components of the MD (eg. foods with high soluble fiber that have been shown to have impact on HbA1c).

Results: Cultural alternatives to foods and components of the MD exist, however there is modest research on the specific health effects of most culturally competent diets as alternatives. *Full results will be available upon presentation of the final paper.*

Discussion and Conclusion: Whilst some evidence-gaps exist, it is feasible to translate most components of the MD to various diets of cultural affinity. Future study is needed to examine the overall effects of these diets, the design and effectiveness of healthcare practitioner training and resources, and the barriers and facilitators to cultural inclusion or health access for a broader range of dietary behaviours.

Funding Sources: No funding was received for the conduct of this research.

Conflict of Interest: The authors declare no conflict of interest.

The teaching kitchen landscape in North America: A scoping review

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Background: Public health researchers have concretely established the role of diet and nutrition and their role in disease prevention and management across all population levels. While many programs aim to enhance the nutrition literacy of its participants, there is a role for food skill instruction in equipping individuals with the skills needed to translate nutritional knowledge at a practical level. Teaching kitchens provide hands-on culinary instruction with concurrent education of nutritional concepts, exercise, mindfulness, and behavioural change. This study will be the first scoping review on the topic, providing a foundation to inform future implementation practices of such education practices to improve health outcomes, food literacy and food agency in program participants.

Objective: The objectives of this scoping review are to: i) understand the extent and type of teaching kitchen interventions utilized in Canada and the United States, ii) to what benefit they provide at both the individual and population level, and iii) to build a foundation of evidence to inform future research.

Methods: The scoping review will be conducted in accordance with the Arksey and O'Malley framework for scoping reviews and be guided by the Preferred Reporting Items for Systematic Reviews and Meta-Analysis Extension for Scoping Reviews (PRISMA-ScR) checklist. A search will be conducted to identify articles from academic databases and grey literature. This scoping review will consider peer-reviewed articles, conference papers, and grey literature describing the use of culinary instruction, or nutrition education with an experiential component delivered to program participants. The search will be limited to those within Canada and the United States, published in English and after the year 2011. Titles and abstracts will be screened independently and in duplicate against the inclusion and exclusion criteria. Data will be extracted based location, funding structure, population served, qualifications of those providing intervention, program duration, evaluation method and process outcomes. A data extraction form will be piloted and tested by all authors on 10% of identified studies and adapted throughout the scoping review based on emergent outcomes. Descriptive statistics will be used to interpret and examine data.

Conclusions: The results obtained through this scoping review may assist in guiding future initiatives to actively map teaching kitchen resources in Canada and may provide a useful tool for collaboration and advancement within this field.

Funding Sources: This project was supported by an arms-length donation to research by Fullscript.

Conflict of Interest: The authors declare no conflict of interest

Evaluating magnesium, zinc and yoga for major depression and depressive symptoms: A narrative review

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Background: Depression affects more than 350 million people worldwide with increasing prevalence. Current first line conventional treatments provide remission in approximately one-third of patients. A variety of alternative interventions have demonstrated clinical efficacy while consistent evidence to support their use is limited and in need of further exploration. This review aims to explore the available evidence on yoga and mineral supplementation as alternative or concurrent treatment options for depression.

Methods: A search of the available literature for randomized controlled trials (RCTs) and meta-analyses was done in PubMed and Google Scholar using the following inclusion criteria: 1 (P). Adults or adolescents with depressive symptoms, or major depressive disorder. 2 (I). Yoga, magnesium, or zinc supplementation, either alone or in conjunction with a drug therapy 3 (C). Comparison to a placebo group, non-intervention, or a nutraceutical treatment. 4 (O). Changes to the Patient Health Questionnaire (PHQ-9), Beck's Depression Inventory (BDI), Hamilton Depression Rating Scale (HAMD/HDRS), or a combination of scores were used as the outcome measures.

Results: Three of the 248 yoga studies found met the inclusion criteria. Three of the 65 magnesium studies found met the inclusion criteria. One meta-analysis and two RCT's of the 59 zinc studies found met the inclusion criteria. All studies included but one magnesium study, found statistically and clinically significant improvements in outcome measures with

their respected interventions. Magnitude of benefit varied between studies, and not all studies used the exact same outcome measures.

Conclusion: The available evidence suggests that yoga, magnesium, and zinc are promising alternative therapies in the treatment of depression in adults and adolescents. Supplementation of zinc and magnesium with or without conventional medication appears to be safe and effective. Yoga as a depression intervention based on the studies examined, was shown to have the greatest magnitude of benefit. Given the limited research available on these interventions, more research is warranted to verify these findings.

Funding Sources: No funding was received for the conduct of this research.

Conflict of Interest: The authors declare no conflict of interest.

The impact of equine therapy on recovery in stroke survivors: A narrative review

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Background: Stroke survivors face many psychosocial and physical challenges. With 80% of stroke survivors discharged into the community, there is a need to facilitate the return to routine activities. Previous studies report that hobbies are associated with productivity and happiness, suggesting the potential for them to be used to facilitate recovery. Existing literature has pointed out the therapeutic benefit of horseback riding, which is purported to help with improving muscle strength. The purpose of this investigation was to analyze the potential therapeutic impact equine therapy has on the recovery of stroke survivors.

Methods: PsycInfo, PubMed, Frontiers, SciELO, Taylor & Francis Online, Annals of Rehabilitation Medicine, J-STAGE, and PLOS ONE were searched using the following search terms: “Therapeutic Horseback Riding,” “Hippotherapy,” “Horseback Riding Therapy,” “Equine Therapy,” “Stroke patients,” “Stroke recovery,” “Brain damage,” “Traumatic Brain Injury,” “intervention,” “Strategy,” “Rehabilitation.” Studies that specifically included stroke survivors within the study population, examined therapeutic horseback riding interventions that involved either mechanically simulated or traditional horseback riding, and were published in English were included.

Results: A total of 70 studies were found and eight met the inclusion criteria. After 24 sessions of mechanical horse simulation, the participants had significant improvement in coordination and were able to adapt and develop specific modes of postural coordination. Balance and gait parameters were also significantly improved and lower rates of depression were reported. In the traditional therapeutic horseback riding groups, balance was significantly improved along with mental health, memory and speech, and decreased rates of depression was reported. All studies included were of medium to high quality, with six of the eight studies incorporating a controlled experimental design. However, five of the studies have a limited sample size with of 20 participants or less, and although some studies claimed to blind their participants, due to the nature of the study this is not possible.

Conclusion: Evidence suggests therapeutic horseback riding aids recovery in stroke survivors by improving balance and reducing symptoms of depression. Future research needs to investigate the most efficient therapeutic horseback riding method, including specifics about frequency and duration of sessions.

Funding Sources: No funding was received for the conduct of this research.

Conflict of Interest: The authors declare no conflict of interest.

Effective integrative health promotion program designs for street-involved youth: A scoping review

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Background: Street-involved youth (SIY) encounter high levels of stigma, discrimination, sexual and physical violence, and financial instability. This results in decreased access to healthcare, social services, employment, education, nutrition, and housing. A multifaceted approach to health and wellbeing may address the challenges that street-involved youth experience, improving emotional, physical, spiritual, structural, and social determinants of health.

Objective: Evergreen Center for SIY seeks to expand their healthcare clinic from a medically plural provision of individual services (including naturopathic care) to SIY, to a more integrated and holistic health promotion strategy. This scoping review maps the attributes and impacts of existing programs to guide the design and focus of this initiative.

Methods: PubMed databases searches were conducted to identify articles describing existing integrative health programs for

street-involved youth using a combination of the following terms: “integrative,” “health promotion”, “street-involved youth”, “community”, “homeless youth”, “vulnerable youth”, “socially vulnerable youth” “programs” and “determinants of health”. Preclinical studies (animal, in vitro), non-English publications, and opinion articles have been excluded. Attributes and outcomes of integrative health programs were mapped to illustrate the scope of the literature on the subject.

Results: Of the limited literature, studies that demonstrated positive impact emphasizes the importance of building a collaborative, trusting connection with youth. Programs that offer the greatest short and long-term gains appear to be those that honour the life experiences of youth, and involve programming including but not limited to; peer harm reduction strategies, relationship-based interventions, and art and sports activities. Integrative programs which bring healthcare providers to youth centers have demonstrated success in increasing use of medical care by SIY.

Conclusion: Available literature reveals themes that guide the design of strategies to serve this population. Organizations serving this population (i.e., Evergreen) are encouraged to apply evidence-informed lenses to program design and evaluation to support this at-risk group.

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Conflict of Interest: The authors declare no conflict of interest.

Varying approaches to urban, food-based community gardens and their relationship to community health and well-being: A scoping review

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Background: It is well known that community gardening improves nutritional literacy, fruit and vegetable intake, and physical activity. It has also been shown to offer mental benefits to individuals and strengthen community resilience and well-being. The COVID 19 pandemic cast a new lens on the importance of community resilience. Community gardening may improve resilience by providing space for social interaction, and opportunities for information sharing and co-learning, while promoting empowerment and wellbeing.

Objective/Purpose: We hypothesized that varying design and intentions underpinning gardens have different effects on community and personal health and resilience. This scoping review aimed to map the evidence for different models of gardening to inform approaches to the design of community gardens.

Methods: Seven databases were searched using terms related to community gardening, community resilience, and well-being. Studies evaluating gardening via controlled interventions or observation by qualitative or quantitative methods that measured social and psychological indicators of individual well-being, along with markers of community resilience were included. Research on non-edible, school, and non-urban gardens were excluded. Results were limited to the English language, and each was reviewed according to PRISMA guidelines for risk of bias.

Results: A total of 32 studies met the study criteria; 14 were qualitative, 13 quantitative, and five mixed methods. Three studies showed the benefits of community gardening on well-being and resilience during the COVID 19 pandemic, and two measured differences in outcome by gardening type; these showed that 1) community gardening may be superior to individual/home gardening for personal well-being; and 2) group style gardens showed more significant improvements in mental health than those from personal/allotment style gardens.

Discussion: While a comprehensive range of health and well-being outcomes are associated with community gardening, only two compared outcomes by gardening type; these were conducted in Asia, thus there is a need for similar studies in North America. Limitations to this study included limited access to social science databases and a broad definition of well-being outcomes. Outcomes should be further refined in future research.

Conclusions: There is a need for more studies comparing well-being and resilience outcomes between personal allotment or group style community gardens.

Funding Sources: No funding was received for this research.

Conflict of Interest: The authors declare no conflict of interest.

A scoping review of the association between vitamin d status and multiple myeloma risk and disease activity

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Background: Multiple myeloma (MM) is a plasma cell cancer that causes monoclonal immunoglobulin proliferation and invasion primarily in bone tissue. Patients with MM are often burdened by lytic bone lesions, pain, fractures, renal dysfunction, hypercalcemia, anemia, and infection. Pre-clinical data suggests that vitamin D may play a role in the etiology of MM, disease activity, and possibly in disease progression. A recent study reported that vitamin D receptor (VDR) gene polymorphisms may influence the risk of MM and can be a molecular marker of MM risk. We conducted a scoping review to map the literature and explore the relationship between vitamin D and MM, focusing on serum levels of vitamin D and the relationship between deficiency with disease risk, progression, and/or survival, along with prevalence and incidence of deficiency in this population.

Methods: Three bibliographic databases (OVID-Medline, OVID-Embase, and OVID-Cochrane Library) were searched on August 18th, 2021, without date restrictions, using a structured approach. Studies were included if vitamin D was the primary intervention or exposure and involved patients with MM and/or MGUS and/or SMM, and was primary research, and published in English, French, or Persian, and included endpoints related to either clinical outcomes, risk, prevalence, incidence, and/or disease progression/survival. Studies were excluded if they were non-primary research, or were non-peer reviewed, or focused on synthetic forms of vitamin D (analogues). Retrieved records were initially deduped using Zotero (referencing software), and then uploaded to Rayyan, a free online tool for conducting reviews. Two independent investigators screened all records by title and abstract (blinded), using a pre-specified list of eligibility criteria. Full texts of remaining records were screened using the same approach, followed by data extraction and verification.

Results: The search strategy yielded 322 records from OVID-Medline (0 duplicates identified), 1100 from OVID-Embase (17 duplicates identified and subsequently removed), and 68 from OVID-Cochrane Library (2 duplicates identified and subsequently removed), producing 1471 studies after inter-database deduping. After records from all three databases were amalgamated, and intra-database deduping was performed by Zotero (207 studies removed), 1264 remained, which were uploaded to Rayyan for screening. Abstract and title screening performed independently by two investigators excluded 1214 records, leaving 50 to screen by full text, of which 34 were excluded, leaving 16 studies for this scoping review. Data extraction of included studies is currently underway.

Discussion: A structured literature search, using three bibliographic databases, was feasible and produced a sufficient study yield to perform a scoping review.

Conclusions: We identified 16 studies that met our scoping review criteria, that will undergo data extraction in order to identify themes and trends, and possibly generate new hypotheses on the topic.

Funding Sources: No funding was received for this research.

Conflict of Interest: The authors declare no conflict of interest.

Supporting the well-being of naturopathic medical students: A pilot project

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Background: Medical students face a unique collection of stressors, both intrinsic and external with consequences to physical, mental, and behavioral health, which ultimately impact quality of patient care. Medical educational institutions play a role in perpetuating or mitigating this experience of stress through a variety of mechanisms. This pilot project aimed to identify trends in stress-perception and well-being among students at the Canadian College of Naturopathic Medicine (CCNM) who participated in an extra-curricular wellness program.

Methods: This project was designed as a quasi-interventional study with before-after comparisons, and comparisons to a small wait-list control group. CCNM students of all years were invited to participate in a two-day facilitated retreat subsidized by the CCNM Thrive student wellness program. The retreat was offered in January 2020 prior to the start of the semester and included a series of interactive skills-oriented workshops intended to promote practices of self-care and stress

management. Following the retreat, three monthly 1.5 hour workshops took place at CCNM between February and April and were co-designed with participants. While workshops were all intended to be delivered in-person, the final two were delivered virtually due to the COVID-19 pandemic restrictions. Objective measures of behaviors and health outcomes were assessed prior to the start of the program, immediately upon completion, and six months after the program concluded.

Results: The analysis is still underway, and will be complete prior to the delivery of the poster. The null hypothesis is that there was no change in outcome measures among participants compared to baseline or to controls. The alternative hypothesis is that students who participated benefitted compared to baseline, and compared to controls.

Conclusion: Conclusions and recommendations will be drawn based on the complete analysis.

Funding Sources: No funding was received for this research.

Conflict of Interest: The authors declare no conflict of interest.

Treating an HIV+ patient with probiotics: A case report of *Blastocystis hominis* pathogenicity

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Introduction: This case report aims to present caution to generalized probiotic treatment in HIV+ patients without awareness of the possible pathogenicity of *Blastocystis hominis*.

Patient Presentation: J.B. is a 61-year-old male taking Triumeq (abacavir, dolutegravir, lamivudine) to maintain undetectable HIV load and an immunostable status. In June 2021, he presented to a community health center and embedded naturopathic teaching clinic for non-digestive concerns, whereby his intern recommended a multi-strain probiotic and vitamin D. In August, J.B. had presented with a new chief complaint of watery diarrhea. Having initiated a position in the film industry, where his union provided meals, he began self-medicating with aloe vera, chlorophyll, and magnesium to help “cleanse” his body from the fast food and to relieve muscle tension from prolonged standing. His intern recommended he re-establish healthy eating habits, reduce his self-medication, and take 1-2 teaspoons of psyllium husk every morning to bulk stools. After 3 weeks, J.B. reported complying with discontinuation of all other supplements yet diarrhea persisted. A stool culture, ova and parasite were requested, in addition to testing his viral load, immunophenotyping, hematology and routine chemistry. Results returned with “moderate *Blastocystis hominis* found.” A 14-day metronidazole treatment initiated in October resulted in reduced defecation frequency. The addition of 5 billion CFU *Saccharomyces boulardii* daily in November returned bowel movements to normal within days.

Discussion: Though extraneous factors prevent a causal relationship to be drawn, it is possible that the quantity of *Blastocystis hominis* reached pathogenic levels when interacting with the *Bifidobacterium longum* contained in J.B.’s multi-strain probiotic. A table of common bacterial strains and their interactions with *Blastocystis hominis* is provided to facilitate probiotic recommendations for patients.

Conclusion: The unexpected chronic watery diarrhea from probiotic treatment highlights the importance of becoming familiar with the *Blastocystis hominis*, the common anaerobic protozoan parasite in the human gastrointestinal tract that may present with variations in its pathogenicity. Screening for commensal microbes that may become pathogenic, particularly in at-risk patients, might be considered prior to administration of multi-strain probiotics.

Funding Sources: No funding was received for this research.

Conflict of Interest: The authors declare no conflict of interest.

How do naturopathic doctors define the quality of natural health products? An inductive approach to establish North American standards

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Background: Healthcare professionals have the responsibility to educate their patients on natural health products (NHPs), yet the assessment of NHP quality throughout North America remains relatively subjective and prone to personal biases, marketing exposure and convenience. For single-ingredient products, third-party laboratories can independently examine the purity and chemical quality of products, but an objective quality assessment for multi-ingredient NHPs is lacking. With the

aim of developing a user-friendly quality scoring system, the identification of subjective and empirical attributes that define a quality product Naturopathic Doctors (NDs) would want to prescribe must be determined.

Methods: This study was divided into two phases. Phase 1 involved one-hour virtual interviews with eight NDs across Canada and the United States who have been licensed and practicing for a minimum of five years. Interviews used open-ended questions to garner common themes defining quality evaluation of complex natural health products. Phase 2 was an online survey to licensed and practicing NDs across Canada and the United States that was entirely based on the key themes extracted from Phase 1. Survey participants were asked to rank-order the themes and sub-themes and could comment on additional items to include in an NHP assessment.

Results: Using an inductive approach to qualitative analysis in Phase 1, four key themes were extracted: sourcing, labeling, monographs, and third-party testing; with each one having several sub-themes. Phase 2 revealed that sourcing was the most important theme, specifically from manufacturing companies that adhere to good manufacturing practices, followed by products on which labels provide specific details of the active compounds. Third party testing ranked third, especially if used to verify that ingredients match the label, and monographs should include referenced evidence on the therapeutic efficacy specific to the recommended dose of the product.

Conclusions: The strongest measure of NHP quality is the manufacturing company's ability to adhere to GMP and high caliber extraction processes. Third party testing could be used to verify standards of quality with product details included in labels and ample referenced evidence in monographs.

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Conflict of interest: The authors have no conflicts of interest to declare.

Investigating the effect of natural interventions on weight loss in overweight and obese adults: A narrative review

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Background: Overweight and obesity is a global health concern with rates increasing worldwide. In Canada, 63.1% of adults are overweight or obese. Standard care includes diet and lifestyle interventions with low engagement and success rates; leading this population to seek out alternative solutions. Green tea extract (GTE), high-protein diets and intermittent fasting are popular weight loss alternatives commonly promoted online. The purpose of this investigation is to analyze these three weight loss interventions and determine their effectiveness at reducing weight.

Methods: Inclusion criteria was defined prior to conducting the literature search: 1) population of overweight or obese adults, 2) intervention with GTE, high-protein diet or intermittent fasting, 3) comparison to placebo, standard protein diet or continuous calorie restriction, 4) changes in body weight as the primary outcome. PubMed was used and articles selected were limited to randomized control trials (RCTs), systematic reviews and meta-analyses. Studies that allowed participants to be on anti-obesity medications or were summarized in included meta-analyses were excluded.

Results: The literature search for GTE yielded 31 studies; 3 RCTs and 1 meta-analysis met the criteria. High-protein diets yielded 596 studies; 4 RCTs and 1 meta-analysis met the criteria. Intermittent fasting yielded 662 studies; 3 RCTs and 1 meta-analysis met the criteria. Significant weight loss of 0.95-1.44 kg with GTE was observed in one study when the active component, epigallocatechin gallate (EGCG), was dosed at 856.8 mg/day. The remaining studies dosed EGCG <650 mg/day with non-significant findings. High-protein diet compared to baseline induced significant weight loss of 3.6 and 7 kg in two studies. All studies with intermittent fasting showed significant weight loss of 0.94-10.7 kg compared to baseline. No statistical significance between groups was observed for intermittent fasting or high-protein diets.

Conclusion: High-protein diets and intermittent fasting can be used synergistically with caloric restriction to manage overweight and obesity and GTE can be used as an adjunct treatment. More research is required to standardize dosage and interventions.

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Conflict of Interest: The authors declare no conflict of interest.

Evaluating nonpharmacologic treatments for bipolar depression: A narrative review

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Background: In Canada, the lifetime prevalence of bipolar I disorder is 0.87% and of bipolar II disorder is 0.57%. Bipolar depression, the depressive phase of bipolar disorder, is challenging to manage because of the potential for treatment-induced mania. The purpose of this investigation is to evaluate specific interventions with an evidence base for use with mild-moderate depression to manage bipolar depression.

Methods: The following inclusion criteria were defined: 1) population including adults diagnosed with bipolar disorder type I or II in a depressive phase, 2) intervention of either N-acetylcysteine (NAC), inositol, or light therapy, 3) comparison group of a placebo for NAC and inositol and sham treatment for light therapy, and 4) outcome reported as mean changes in the Hamilton Depression Rating Scale (HAM-D) or the Montgomery-Asberg Depression Rating Scale (MADRS). Studies were found using PubMed and the Cochrane Library.

Results: After excluding duplicates, the literature search for NAC yielded 33 studies, of which two meta-analyses and one RCT met the criteria. Inositol yielded 30 studies, of which three RCTs met the criteria. Light therapy yielded 64 studies, of which one meta-analysis and two RCTs met the criteria. No restriction was applied to the publication date. The article type was limited to clinical trials, meta-analyses, RCTs, and Cochrane reviews. Meta-analyses with substantial overlap, RCTs already summarized in included meta-analyses, and studies with more than one experimental intervention were excluded. Light therapy studies showed a mean HAM-D score reduction of 4.0-10.6 and a standardized mean difference of 0.43 (95% CI: 0.04-0.82, $p=0.03$), one inositol study found a statistically significant ($p<0.08$) mean MADRS score reduction of 10.6, and a meta-analysis of NAC RCTs found a standardized mean difference in depressive symptom scores of 0.45 (95% CI: 0.06-0.84). Sample sizes were small, and significant heterogeneity exists between studies. Dose ranges were 250–10,000 lux white or green light for 15-360 min/day for light therapy, 9.5–16.15 g/day maximal dose for inositol, and 1-3 g/day for NAC.

Conclusion: All three interventions show potential as therapies for bipolar depression, but more high-quality research is needed.

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Group visits in naturopathic medicine: Mapping the alignment

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Objective: Evaluations of group based medical/educational visits (GEMVs) identify a number of benefits to disease-, behaviour-, and patient-oriented outcomes. Both providers and participants identify greater personal satisfaction and self-esteem associated with participation. It is hypothesized that this likely translates to cost-savings in the healthcare system through efficiency, the value of prevention, and the building of participant self-efficacy. Naturopathic principles appear to align naturally with a group-model of care delivery. Many of the benefits noted in the literature, and experientially by the authors, exemplify the philosophy of naturopathic medicine. To date there is a dearth of evidence exploring the use of GMEVs by naturopathic doctors. This poster maps the available evidence for group visits to the principles of naturopathic medicine, and outlines best practices of planning and implementing this approach to health care.

Methods: A literature review was performed to identify themes of harms and benefits of group medical visits. We then engaged in a scholarly process of consensus building to map the documented benefits for GMEV to the principles of naturopathic medicine. We also applied Kolb's experiential learning model to reflect on our own experiences designing and delivering GEMVs through the lens of adult learning theory.

Results: Each of the naturopathic principles are well supported in the evidence for the value and application of group visits. Naturopathic doctors are skilled in the domain of education, the foundation of a well-designed GEMVs (*docere*). The interactive nature of group visits adds elements of support, motivation and learning opportunities that one-on-one appointments cannot provide. This may increase the potential for lifestyle change (*praevenic*), overcome psychosocial barriers to accessing care (*tolle totum*), create opportunities to identify and address root causes of disease (*tolle causum*), and effectively liberate the individual's natural capacity to heal (*vis medicatrix naturae*). Adult learning theory can guide strategies used in the planning and delivery of group sessions to optimize their value.

Conclusion: Naturopathic medicine is ideally suited to group-based delivery. We recommend that naturopathic medical schools and continuing education programs offer evidence-informed opportunities to develop skills of designing and

delivering group visits in order to maximize benefit and minimize harm.

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Investigating behavioral and psychosocial therapies for the prevention of postpartum depression: A narrative review

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Background: Postpartum depression (PPD) is the most common complication of childbearing. The American Psychiatric Association defines PPD as a unipolar depressive disorder occurring within 4-6 weeks after giving birth and lasting for at least 2 consecutive weeks. The purpose of this investigation was to analyze the evidence on the preventative effect of the nonpharmacologic interventions of exercise, cognitive behavioral therapy (CBT), and educational programs for PPD.

Methods: PICO criteria were defined prior to conducting the literature search in PubMed and Google Scholar: the population had to include pregnant people 2) intervention of exercise, educational programs, or cognitive behavioral therapy used as monotherapy 3) comparison to routine pregnancy healthcare not receiving any intervention 4) the Edinburgh Postpartum Depression Score (EPDS) had to be included as an outcome measure. The articles were limited to randomized clinical trials (RCTs) and meta-analyses. Only RCTs not summarized in the meta-analyses were summarized in this review.

Results: The exercise search yielded 56 studies, of which 2 RCTs and 1 meta-analysis met the criteria, education yielded 184 studies of which 3 RCTs met the criteria and CBT yielded 150 studies of which 2 RCTs and 1 systematic review with meta-analyses met the criteria. The evidence for psychosocial interventions showed a 27% reduction in depressive symptoms compared to controls. Statistically significant differences in EPDS scores were observed in one of the two RCTs of CBT with treatment scores of 6.3 ± 5.3 versus 10.4 ± 5.9 in controls. All educational program studies showed statistically significant reductions in the prevalence of PPD with rates of 6.7% - 30.2% of treatment participants versus 34.3% - 48.2% in controls. The evidence for exercise interventions indicated aerobic exercise with strength training was not effective in lowering the prevalence of PPD. Limitations included differences in EPDS cut off scores, small sample sizes, and significant differences in methodology and intervention delivery. Only the education studies included a baseline and post-test EPDS score.

Conclusion: Evidence suggests educational programs and CBT can be used for the prevention of PPD. Substantial heterogeneity exists between studies and warrants further research.

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Pediatric iron deficiency anemia as a mediator of transgenerational perpetuation of disadvantage: A conceptual framework

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Objective: Iron deficiency is the most common nutritional deficiency in pediatric populations worldwide, particularly among populations that have been structurally marginalized. Not only are children from these populations more likely to live with risk factors for iron-deficiency, systemic inequities and bias in healthcare often result in misdiagnosis of children with iron-deficiency anemia (IDA). Even if iron repletion occurs through supplementation, long term physiological consequences include reduced cognitive and psychomotor function, lifelong tendency to anemia, reduced immunity, failure to thrive, abnormal sleep cycles, and dopamine deficiencies. Together, these issues may contribute to longer term impacts, including reduced academic performance, behavioral issues, lower economic potential, and an increased risk of criminalized behavior, all of which increase the social determinants of IDA in the next generation. We hypothesize that IDA serves as a model for the ways in which socioeconomic disadvantages are perpetuated across generations. It is a mechanism via which other determinants of childhood health - such as food security, access to culturally competent healthcare, nutritional literacy, exposure to environmental toxins, maternal gestational and birthing outcomes, and parasitic infections - may contribute to lifelong and transgenerational potential.

Methods: As a hypothesis-generating project, we will conduct a literature scan to explore the causes and consequences of pediatric iron deficiency. This will inform the creation of a conceptual framework demonstrating the way in which IDA acts as a mechanism of transgenerational perpetuation of disadvantage. Using this framework, we will propose considerations for

disrupting this mechanism by addressing root social and ecological causes of disease, and the ways in which they intersect.

Results and Conclusions: Full results will be available upon presentation of the final paper.

Funding Sources: No funding was received for this research.

Conflict of Interest: A current research member has an ownership in a company that provides supplements with iron.

Effects of outdoor learning school-based education programs: A systematic review on pediatric health outcomes

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Background: School- and curriculum-based outdoor programs likely promote beneficial emotional and physical wellbeing in children. This systematic review aims to identify the mental, physical and emotional outcomes of a variety of school- and curriculum-based outdoor education programs.

Methods: Online databases were used to identify English peer-reviewed journal articles that reported any outcomes of outdoor-education programs on participants.

Results: Twenty papers were included in our analysis. Eleven studies described cognitive outcomes, nine studies social, affective, and psychological outcomes, and ten studies physical activity outcomes.

Conclusions: School- and curriculum-based outdoor programs have a beneficial role in the wellbeing and quality of life for children. These results support further research into the application of school- and curriculum-based outdoor education programs to improve intellectual, social, physical, psychological, and health-related outcomes.

Funding Sources: No funding was received for this research.

Conflict of Interest: The authors declare no conflict of interest.

Naturopathic management of acute pediatric respiratory infections: A modified Delphi study

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Objective: Antibiotics are instrumental in treating bacterial infections. However, inappropriate prescribing contributes to antimicrobial resistance, a significant threat to global health. The Centers for Disease Control and Prevention (CDC) has identified five acute pediatric respiratory conditions as requiring scrutiny in terms of antibiotic stewardship (otitis media, rhinitis, pharyngitis, bronchiolitis/bronchitis, pneumonia) due to overprescribing. We theorize that naturopathic strategies may reduce the demand for antibiotics by guardians during the watchful waiting period. This study sought to identify strategies used by experienced naturopathic practitioners to manage these five conditions.

Methods: We recruited practitioners experienced in pediatric care in Canada, the United States, and Australia to participate in a modified Delphi panel. Participants responded to an open-text survey about their approach to these pediatric infections. Results were coded and used to create a second survey in which participants were asked to indicate their agreement to a series of statements. Items were deemed to have reached consensus if the mean score exceeded 70% agreement, or failed to reach 40% agreement. Items between these boundaries were modified and retested until consensus was reached, or four rounds had been completed.

Results: Fourteen practitioners from jurisdictions with diverse scopes of practice participated. Results revealed consensus on a number of approaches to the management of acute pediatric respiratory infections, and suggested that most respondents rarely deem it necessary to prescribe or refer for antibiotics. Items that failed to reach consensus may be related to diverse training, legal scope, and/or individual approach to practice.

Conclusion: The Delphi method is helpful when seeking to determine consensus among experts in a field. It doesn't reveal what is generally done in practice, and can not be interpreted as evidence for effectiveness or safety of these approaches. However, results could be significant for the purposes of communicating the role that naturopathic doctors play in stewardship of antibiotics (as called for by international health organizations) through management of acute pediatric

respiratory infections.

Funding Sources: No funding was received for this research.

Conflict of Interest: The authors declare no conflict of interest.

Maternal fiber intake and perinatal anxiety and depression: A review

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Background: The importance of maternal nutrition on pregnancy, neonatal and long-term infant health outcomes have long been acknowledged. The association between maternal mental health and antenatal diet, however, remains underexplored, particularly in the context of fiber intake. The role of the gut microbiome in psychiatric outcomes through the bidirectional communication of the Gut-Brain Axis, and the effect that indigestible carbohydrates have on gut microbiota and subsequently derived metabolites, calls for a closer investigation on fiber's role in mental health disorders, especially in the pregnant population.

Objective: To investigate the association of fiber intake and maternal anxiety and depression in the perinatal period during pregnancy and postnatal period.

Methods: A literature review of PubMed and Google Scholar using the keyword/MeSH terms was conducted [diet, nutrition, dietary pattern, diet quality, fiber/fibre, prebiotic, oligosaccharides, complex carbs, prebiotics, diet therapy, symbiotic, FOS, fructooligosaccharides, inulin, oligofructose, GOS, galactooligosaccharide, xylooligosaccharides, vegetables, fruits, whole grains, legumes, fiber/fibre supplements, vegetarian] AND [mental health, anxiety, depression, mental illness, well-being, mood, stress, psychiatric disorders, psychological status, dysthymia, baby blues] AND [antenatal, pregnancy, postpartum, perinatal, peripartum, maternal, gestational age, lactation, breastfeeding]. Observational and clinical trials published since 2015 with pregnant and/or breastfeeding/postpartum women were included. Reviews, meta-analyses, animal studies, studies older than 2015, and studies including bipolar, schizophrenia or psychosis were excluded. Article titles and abstracts were screened independently and data on diet, mental health outcomes and demographic factors were extracted.

Results: In progress. Findings will be presented descriptively, including a portrayal of screening and a summary of the studies that were included.

Conclusions: Results from this study will help inform the present understanding of the role of fiber in perinatal mental health disorders, and lay the groundwork for investigating maternal gut microbiome, diet and mental health outcomes.

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Tarentula hispanica in the treatment of long-term restless leg syndrome: A case report

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Introduction: Restless legs syndrome (RLS), also known as Willis-Ekbom disease, is a common multifactorial neurological condition with unclear etiology. Possible explanations of the disease include iron deficiency and abnormally high brain dopamine levels. Presently, there is no scientific evidence to show the efficacy of a homeopathic remedy on RLS. The aim of this case report is to show the effect of Tarentula Hispanica, as a homeopathic remedy, in long-term RLS with possible dopamine imbalance.

Patient Presentation: A 73-year-old Caucasian female, retired healthcare professional presented to RSNC with prior diagnoses of RLS, arrhythmia, hypertension, hypercholesterolemia, hyperhidrosis and knee pain. She was taking pramipexole (dopamine agonist) 0.25 mg once, sometimes 0.50mg before bedtime for 11 years for RLS, rosuvastatin for hypercholesterolemia for 21 years and metoprolol for arrhythmia for 16 years. She was taking 400 mg magnesium inconsistently for a few months when she came to her first visit. Whenever she forgot to take pramipexole, her RLS symptoms were aggravated at night. Therefore, she couldn't sleep without taking the medication. Her bloodwork results were within normal limits, including ferritin and vitamin B12. It was recommended to take tarentula hispanica 200 CH two pellets before bedtime for 3 days instead of pramipexole. Her RLS symptoms disappeared completely after taking tarentula

hispanica on the first day, and she was very surprised as it had never happened in the last 11 years. She continued to take the remedy the following 3 days, then she discontinued. She has only had a mild burning sensation in her feet, this was improved with hydrotherapy, but it didn't affect her sleeping quality. International Restless Leg Syndrome Study Group Rating Scale was used to assess the severity of symptoms that were 19 (moderate) before and 0 (none) both in the first week and 6 months after the remedy.

Conclusion: This case illustrates that dopamine agonist is beneficial for RLS by carrying the risks of side effects. Even though the mechanism of action of the homeopathy is not clear yet, a homeopathic remedy can be also helpful without having any known side effects. In this case, Tarentula Hispanica was fully effective for discontinuing the long-term medication. Further clinical studies are required.

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Hot and cold theory: A bridge from the past to the future (Narrative Review)

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Background: The hot and cold theory represents the dynamic state of health and disease for each individual. This concept is a fundamental pillar of traditional medicines (TMs) all around the world, while it is discarded in conventional medicine. The goal of this project was to define and assess the scientific evidence for this concept.

Methods: Thirty-one scholars contributed to this project. Four groups worked on traditional Chinese, Persian, Ayurvedic and South American and Caribbean medicines. They assessed foundational references of each TM field which were selected based on expert opinion, as well as electronic databases in both the native language of each TM and English. The other four groups of scholars performed narrative reviews on scientific evidence in four areas of nutrition, pharmacology, physiology and systems biology for the theory of hot and cold.

Results: The spectrum of hot and cold represents the state of body balance which is affected by genetic, lifestyle, and environmental factors. Based on the research, individuals with hot or cold temperaments are different in neuro-endocrine-immune system's balance, metabolism rate, and expression of genes/biological pathways. The hot and cold nature of foods and herbs seems to be associated with their effects on body metabolism, autonomic nervous system balance, oxidation potential, vasodilatory and pro-inflammatory properties, effects on inflammation and immunity-related genes, and phytochemical content

Discussion and Conclusion: The definitions and beliefs about hot and cold theory in four TM systems and the available scientific evidence for this theory were presented in this project. The hot-cold concept is also part of other TM systems such as European traditional medicine, Korean medicine, Iban medicine and Japanese medicine which were not included in the current project due to our limited access to resources and experts in these fields. This theory implements a holistic approach in which the state of health is different from one person to another. Therefore, preventive and treatment methods should be tailored to each individual. It is postulated that hot-cold classification is capable of predicting the omic patterns that will be the pillars of personalized medicine. This opens a new horizon in bridging these old traditional concepts to the future of medicine. According to the studies, this approach has the potential to be integrated into conventional medicine protocols for preventive, diagnostic, treatment and rehabilitation purposes.

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A review of systems biology studies on the hot-cold theory

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Background: Many studies have investigated the biological foundations of the "Theory of Hot and Cold", a mutual concept in traditional medicines (TMs). In this narrative review, available studies that used omics techniques and systems biology approaches in order to better understand the concept of hot and cold were investigated.

Methods: Systems biology/omics-based studies explaining Hot and Cold concepts in traditional Chinese medicine, Persian medicine, Ayurveda, and Korean medicine were collected. Enrichr, an enrichment analysis web-based tool

(<http://amp.pharm.mssm.edu/Enrichr>) was used to find the Biological Processes Gene Ontology (GO) terms for the common genes reported to be involved in hot/cold classification in different TMs. The Kyoto Encyclopedia of Genes and Genomes (KEGG; <http://www.kegg.jp/>) was used for determining the KEGG pathways for potentially important genes. Then we discussed the findings for these common genes in terms of the scientific explanation of the traditional medicine hot and cold concept.

Results: Among different genes reported to be involved in hot/cold classification in 52 studies, at least 15 genes had overlap between various TM systems including ADM, ANPEP, FCGR2A, HSPA1A, HSPA8, IL8, IL1R2, KCNJ2, MYO5C, UBQLN4, and some of the CYP gene family members. Some of the related KEGG pathways for these genes are: “Metabolic pathways”, “Protein processing in the endoplasmic reticulum”, “Thyroid hormone synthesis”, and metabolism of “Xenobiotics”, “Drugs”, and “Glutathione” by CYP. The most frequent GO terms for these common genes are: “negative regulation of cell proliferation”, “neutrophil degranulation”, “cellular response to heat”, “cytokine-mediated signaling pathway”, “fatty acid metabolic process”, “lipid metabolic process”, and “oxidation-reduction process”.

Discussion and Conclusion: The holistic nature of systems biology approaches may help in better understanding of biological bases of hot/cold concept. Based on this review, more inflammation and immune-related pathways, elevated metabolism-related pathways, and insulin signaling pathway/insulin receptor binding GO molecular function, have been reported in individuals with hot temperament, while the cold temperament is associated with “cell growth”, “cell signaling and cell division”, and diminished metabolism pathways. The traditional medicine diagnostic criteria for personalized treatment are associated with the findings of OMIC studies in precision medicine. This may open new horizons in accessible personalized medicine in future.

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Conflicts of Interest

The authors of this abstract collection declare that they have no conflict of interests.

Authors' Contributions

MA: co-founded the first CCNM Research Day.

KC: co-founded the first CCNM Research Day.

TT: contributed equally to planning the research competition, assisted in the collection and review of the abstract submissions, as well as support for authors selected for the competition while producing their posters.

MA: contributed equally to planning the research competition, assisted in the collection and review of the abstract submissions, as well as support for authors selected for the competition while producing their posters.

SM: contributed equally to planning the research competition, assisted in the collection and review of the abstract submissions, as well as support for authors selected for the competition while producing their posters.

NE: contributed equally to planning the research competition, assisted in the collection and review of the abstract submissions, as well as support for authors selected for the competition while producing their posters.

KC: contributed equally to planning the research competition, assisted in the collection and review of the abstract submissions, as well as support for authors selected for the competition while producing their posters.

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