

The 8th 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 8th annual CCNM Research Day hosted 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; dietary supplements; integrative medicine; natural health products; nutrition; undergraduate research competition; innovation; mentors

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Conference Abstracts

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Myelodysplastic Syndrome and Hemoglobin Improved by Intravenous Nutrient Therapy: A Case Report

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Myelodysplastic Syndromes (MDSs) are variations of bone marrow failure disorders that lead to insufficient production of healthy blood cells culminating in some combination of low red blood cells, low white cells or both. This case report presents a case of increased hemoglobin levels following intravenous (IV) vitamin/mineral therapy. JB is a 74-year-old male who presented with a chief concern of MDS. As a result of this condition, he was experiencing extreme fatigue and exhaustion, episodes of shortness of breath and a decline of hemoglobin levels. He was being followed by a hematologist who monitored his CBC at regular intervals, with a primary focus on blood hemoglobin levels. His hemoglobin levels were significantly lower than the normal range, however they never fell below 75 g/dL, the threshold for a blood transfusion and his only treatment option. Beginning in November 2021, weekly to biweekly IV vitamin/mineral therapy treatments were initiated. Thirty-nine IV treatments were given in all until August 2023. IV nutrient formulas included Meyer’s Cocktail, High Dose Vitamin C (25gm), Hydrating Meyer’s Cocktail and Meyer’s Cocktail + glutathione. As IV treatments were being provided, JB’s blood hemoglobin levels were assessed regularly by his hematologist. A trend was observed showing a consistent improvement of hemoglobin levels over time. The greatest degree of hemoglobin value improvement was observed after the series of Hydrating Meyer’s Cocktails. In addition, the patient reported improved overall fatigue and a decrease in recovery time from activity. Delivering a series of IV infusions may have resulted in an improvement of hemoglobin levels in this patient. Further investigation is warranted to understand the potential IV nutrient therapy could have on MDS patients with a similar prognosis.

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

Conflicts of Interest: The authors have no conflicts of interest to declare.

Assessing the Effects of Carnitine and Coenzyme Q10 Supplementation on Sperm Quality: A Narrative Review

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Background: Infertility is often considered a female condition, with considerable attention being given to women's reproductive health and research on male infertility is limited. However, one third of infertility cases are caused by “male factor” infertility, and approximately 2% of all men will exhibit suboptimal sperm parameters. Nutritional factors play a crucial role in sperm health and male fertility. The application of interventions has the potential to be an affordable, efficient, and easily implementable treatment for male infertility. The evidence for safety and efficacy of two interventions will be summarized in this review: L-carnitine/acetyl-L-carnitine and coenzyme Q10 (CoQ10).

Methods: PubMed and Google Scholar were used to search for studies according to specific PICO criteria. Parameters were set to 1) adult men with infertility, 2) comparison to a placebo control group, and 3) sperm concentration had to be one of the outcome measures. Limits were used to refine results to randomized controlled trials, meta-analyses, and human studies.

Results: A total of three articles on CoQ10 and three articles on L-carnitine with acetyl-L-carnitine were selected for this review, other articles were available on the topics but were either covered in meta-analyses already included or did not accurately meet PICO criteria. The results of two out of three articles found that CoQ10 supplementation significantly increased sperm concentration when compared to placebo. Only one article found L-carnitine with acetyl-L-carnitine to increase sperm concentration. However, all three articles found that it significantly increased sperm motility. There was significant heterogeneity in dosing and magnitude of benefit between studies.

Conclusion: The evidence suggests that both CoQ10 and L-carnitine with acetyl-L-carnitine show potential for improving sperm parameters. CoQ10 may be an effective treatment consideration for low sperm concentration and L-carnitine with acetyl-L-carnitine may be an effective treatment consideration for low sperm motility. These findings call for more research before protocols and best practices can be established.

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

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

Effectiveness of Plant Sterols/Stanol, Exercise, and the Mediterranean Diet on Serum Cholesterol Levels: A Narrative Review

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Background: Currently, the only drug class approved for the primary prevention of cardiovascular disease is statins. They are also a first-line option for improving lipid parameters with the potential to reduce low-density lipoprotein (LDL) cholesterol levels by 15–30%. However, their adverse effects can result in disengagement from therapy and motivate people towards non-drug alternatives. This study aimed to appraise the literature for the ability of plant sterols/stanol, exercise, and the Mediterranean diet to alter serum LDL cholesterol levels.

Methods: PICO criteria for each intervention were defined prior to conducting the literature search. Study population had to be adults. Interventions of plant sterols/stanol, exercise, or Mediterranean diet. A placebo control for plant sterols/stanol, no treatment for exercise, and a low-fat diet for the Mediterranean diet. The outcome measure was a change in serum LDL cholesterol levels. The search was limited to the PubMed database and the human, randomized controlled trial (RCT), and meta-analysis filters applied. Only RCTs not summarized in included meta-analyses were included.

Results: A total of three articles on plant sterols/stanol, four on exercise, and three on the Mediterranean diet met the criteria. Of the ten studies appraised, eight demonstrated statistical significance with seven indicating positive benefits to natural interventions. No clinically significant changes were observed. Non-pharmacological interventions can provide up to 0.60 mmol/L reductions to serum LDL cholesterol levels. The greatest effects are achieved with 1) consuming 2-2.5g/day of plant sterols/stanol within a fat spread or with meals, 2) exercising (best if endurance training or aerobic plus resistance training) in the evening, and 3) consuming a Mediterranean diet enriched with virgin olive oil. All interventions were well tolerated by participants.

Conclusion: Findings in this review did not show results that were superior to statin use. However, the non-pharmacological treatment options discussed in this review should not be disregarded, as they can serve as valuable tools in aiding the prevention and management of dyslipidemia.

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

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

Evaluation of Curcumin, Moxibustion, and Tens as Treatment Options for Dysmenorrhea: A Narrative Review

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Background: Dysmenorrhea refers to painful menstruation and can be accompanied by nausea, diarrhea, back pain, and headache. Between 45–93% of menstruating women have dysmenorrhea, and 15% are debilitated for 1–3 days per month, with adolescents having the highest percentage. Dysmenorrhea has an impact on quality of life, physical and mental well-being, sleep and mood, academic and professional performance, and personal relationships. Drug options exist to help alleviate pain but may have undesired adverse effects or may be contraindicated. The study aims to evaluate evidence for three non-drug interventions, curcumin, moxibustion, and transcutaneous electric nerve stimulation (TENS), for dysmenorrhea.

Methods: PICO criteria for each intervention were defined prior to conducting the literature search. Study population had to be people with primary or secondary dysmenorrhea. Interventions of curcumin, moxibustion, or TENS. A placebo or sham control. The outcome measure was a change in menstrual pain measured by visual analog scale (VAS). The search for randomized controlled trials (RCT) and meta-analyses was conducted in PubMed, ScienceDirect, Cochrane database, and Google Scholar limited to human studies and those published in English. Only RCTs not summarized in included meta-analyses were included.

Results: The literature search for curcumin yielded 211 studies, of which three RCTs met the criteria. Moxibustion yielded 76 studies, of which two RCTs and two meta-analyses met the criteria. TENS yielded 109 studies, of which five RCTs and three meta-analyses met the criteria. The use of curcumin showed a reduction in VAS, but dosage, duration of administration, and magnitude of effect differed. All three studies for moxibustion showed statistically significant improvement in VAS, but the frequency of administration and timing around menses differed. All three studies for TENS showed a statistically significant reduction in VAS within 20 minutes of administration, although placement of electrodes and frequency were different.

Conclusion: Curcumin, moxibustion, and TENS are potential options to support patients with dysmenorrhea, although significant heterogeneity exists.

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

Conflicts of Interest: The authors have no conflicts of interest to declare.

Vitamin D and Probiotics for the Treatment of Atopic Dermatitis in Children: A Narrative Review

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Background: Atopic dermatitis (AD) is a persistent and chronic itchy skin condition that can severely impact quality of life. The prevalence of AD in children is 10–20%, costing \$1.4 billion annually with the prevalence increasing in industrialized countries. While corticosteroids and other topical and systemic agents can be effective, they are not free of adverse effects. With the prevalence of corticosteroid phobia, many seek alternative methods of treatment. This study aims to appraise the evidence for two specific non-drug interventions: vitamin D and probiotics.

Methods: PICO criteria were defined before conducting the literature search. Population had to be children with AD. Interventions were vitamin D and probiotics compared to placebo control. The outcome measure was a change in Scoring Atopic Dermatitis (SCORAD) or the Eczema Area and Severity Index (EASI). The search was limited to randomized control trials (RCT) and meta-analyses in the PubMed database. The human filter was applied with the date restriction set to include studies from 2015–2023. Only RCTs not summarized in included meta-analyses were included.

Results: The literature search for Vitamin D supplementation yielded 23 results, of which two RCTs and one meta-analysis met the criteria. Probiotic supplementation yielded 41 results of which two RCTs and one meta-analysis met the criteria. All three probiotic studies showed a statistically significant decrease in SCORAD compared to control with a high level of heterogeneity due to the use of different combinations or single strains. One study on vitamin D found a decrease in SCORAD after supplementation compared to control. The dose and duration of supplementation varied between all three studies.

Conclusion: Probiotics may be a viable treatment option for AD in children, however, more research on the benefits of specific strains for this condition is needed. The research presented here doesn't support vitamin D supplementation for AD treatment in children. More studies with dose and duration standardization are needed.

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

Conflicts of Interest: The authors have no conflicts of interest to declare.

Assessing the Effects of Cold Water Immersion, Acupuncture, and Branched-Chain Amino Acid Supplementation on Delayed Onset Muscle Soreness: A Narrative Review

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Background: Perceived muscle soreness may impede the ability to produce powerful movements, reduce range of motion, and cause biomechanical problems, ultimately decreasing efficiency and increasing risk of injury. Cold water immersion, acupuncture, and branched-chain amino acids (BCAA) supplementation are commonly practiced by athletes under the notion they mitigate muscle damage and accelerate recovery. Evaluating the efficacy of these interventions to reduce subjective reports of muscle soreness following physical activity could allow for superior athletic performance.

Methods: Separate literature searches were conducted for each intervention. PICO criteria were defined before conducting a literature search, all of which had the same population and outcome measurements. Study populations were comprised of non-injured adults following a bout of exercise and outcome measures included subjective reporting of delayed onset muscle soreness (DOMS) using the Visual Analogue Scale (VAS). Cold water immersion was compared to passive rest controls, acupuncture interventions were compared to no treatment, and the consumption of BCAAs was compared to placebo controls. Literature searches were limited to PubMed and ScienceDirect. Only trials not included in the summarized systematic reviews and meta-analyses were included.

Results: The literature search for cold water immersion yielded 115 results, with two RCTs and one meta-analysis meeting the criteria. Acupuncture yielded 93 results, of which one RCT, one parallel-group trial, and one meta-analysis met the criteria. BCAAs yielded 47 results, with one RCT, one counterbalanced trial, and one meta-analysis meeting the criteria. All interventions were found to significantly improve VAS reports of DOMS. Cold water immersion was most effective 48–72 hours post-treatment, while acupuncture provided fast-acting improvements. BCAA proved most effective when used on days prior to and following exercise.

Conclusions: The existing literature indicates that cold water immersion, acupuncture, and BCAA supplementation are appropriate interventions to prevent and treat DOMS. The interventions decrease DOMS by varying mechanisms, showing potential for synergistic effects when used in combination.

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

Conflicts of Interest: The authors have no conflicts of interest to declare.

Evaluating Oral Supplementation of Zinc for Chemotherapy- And Radiation-Induced Oral Mucositis: A Narrative Review

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Background: Oral mucositis (OM) creates painful inflammation and ulcerations of the oral mucosa, and is a common side effect of chemotherapy and radiation therapy. On its own, OM should heal after treatment has concluded, but it can last for 2–12 weeks, affecting patients' nutrition and quality of life. Standard care includes topical and oral pharmaceutical interventions, and changes to oral hygiene practices. Zinc, a mineral essential in our body, enhances the immune system, cell signalling, and has been shown to have a relationship with wound healing. The purpose of this investigation is to evaluate evidence on the effect of zinc for chemotherapy and radiation-induced OM.

Methods: The following inclusion criteria were defined: 1) population including adults at risk of developing OM due to chemotherapy or radiation, 2) intervention with zinc, 3) placebo comparison group, and 4) outcome reported as reduction in an OM grading scale. The search was limited to the PubMed and Cochrane Library databases and the English language. The Cochrane search was limited to 2018–2023, as the last meta-analysis covered up to 2017. Articles were limited to randomized controlled trials (RCTs) and meta-analyses. Only RCTs not included in the meta-analyses were summarized in this review.

Results: The literature search yielded forty-one studies from PubMed and four from Cochrane Library. Six RCTs and one meta-analysis of ten RCTs met the inclusion criteria. Five studies, including the meta-analysis, found benefit in zinc reducing the incidence and/or severity of OM. Two studies found no statistical significance between groups.

Conclusion: Evidence suggests that zinc may be helpful in reducing the incidence and/or the severity of oral mucositis, but considerable heterogeneity exists between the studies, and further research is needed.

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

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Effects of Fasting Mimetic Diets on Chemotherapy Efficacy and Side Effects: A Scoping Review

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Background: According to the International Agency for Research on Cancer, the number of new cases of cancer in Canada was estimated to be 250,000; the vast majority of these cases receive chemotherapy as treatment. Over recent years, a growing body of research has accumulated on the possibility that dietary practices, specifically those mirroring the mechanisms of fasting (i.e., fasting mimetic diets (FMDs)) might play a pivotal role in the efficacy and side effect profile of chemotherapy. This hypothesis also speculates on the potential for FMDs to improve tolerance and completion of prescribed chemotherapy courses, ultimately optimizing treatment, and to positively shift cancer outcomes. Synthesis research is required to help understand the existing evidence surrounding this hypothesis.

Methods: The revised Arksey and O'Malley framework for scoping reviews provided a scaffolding for the design and conduct of this scoping review. To explore the literature on PubMed regarding the impact of dietary patterns on cancer treatment outcomes, search terms such as "cancer," "oncology," "fasting mimetic diet," "Chemotherapy", "Chemotherapy side effects", "efficacy", and "calorie-dense diet" were used to identify pertinent clinical studies and reviews on the efficacy and safety of FMDs as adjunct therapy in cancer treatment. Two reviewers independently screened and identified studies against inclusion criteria; data was extracted using a pilot-tested data extraction form focussed on the study's demographics, outcomes, details of the FMD intervention, chemotherapy response rates, toxicity, safety and adverse effects, and impact on cancer progression and overall patient well-being.

Results: Our search yielded a total of 34 potential studies for inclusion. After screening, a total of 16 papers met inclusion criteria. Among the 16 included studies, the largest proportion were in human trials (seven), indicating a significant interest in the clinical application of fasting mimetic diets for cancer treatment. Additionally, there were two animal studies and three animal/cell culture studies, with four papers not specifying the study types. The seven human studies varied in design, including randomized controlled trials (RCT), single-arm prospective clinical trials, and phase I/II clinical trials. These studies encompassed a broad range of cancer types, including breast carcinoma, various advanced and localized cancers, and one involving 18 different types of cancer. Populations across these studies are diverse, with participants varying in age, gender, cancer type, and chemotherapy regimens, offering a broad perspective on the applicability of fasting mimicking diets in oncology.

Discussion/Conclusion This varied methodological approach weighted towards human level research may be indicative that the data is being formed from a 'top down' approach oriented towards patients and clinical reasoning. The existing, albeit small, body of evidence suggests there is potential benefit for FMDs as an adjunctive therapy to enhance treatment response, reduce adverse effects, and potentially slow tumor progression. The rationale for FMD aligns with the concepts of differential stress resistance (DSR) and differential stress sensitization (DSS) to increase the toxicity of chemotherapy. Despite the promising outcomes, limitations such as the lack of large, randomized controlled trials in unique groups and wide variety of chemotherapy regimens was noted. There is a need to conduct further research to conclusively determine the benefits and mechanisms of FMD in cancer therapy while still advancing studies oriented towards assessing effectiveness and efficacy. The findings of this review may aid in the formation of a more targeted research agenda and help inform cancer treatment guidelines.

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

Conflicts of Interest: The authors have no conflicts of interest to declare.

Evaluating Aromatherapy, Exercise and Ginkgo Extract for Behavioural and Psychological Symptoms of Dementia: A Narrative Review

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Background: Approximately 90% of people living with dementia experience behavioural and psychological symptoms (BPSD) throughout the progression of their illness. Current pharmaceutical standards are of modest benefit and not without adverse effects. First-line recommendations include non-pharmacologic therapies but with no clear clinical guidelines on administration. This study aims to evaluate evidence for three non-drug interventions, aromatherapy, exercise, and ginkgo extract, for BPSD.

Methods: PICO criteria were defined as the following: 1) study populations had to be people living with dementia; 2) the interventions could be aromatherapy, exercise, or Ginkgo Extract EGb761; 3) controls had to be non-fragrant liquids, usual activities, or placebo, respectively; 4) the outcome measure was a reduction in BPSD as measured by the neuropsychiatric inventory (NPI). The search was limited to PubMed using randomized controlled trials (RCT) and meta-analysis filters.

Results: The literature search for aromatherapy yielded 24 results, of which three RCTs met the criteria. Aerobic exercise yielded 17 results of which two meta-analyses and one RCT met the criteria. Ginkgo Extract EGb761 yielded 108 results, of which two meta-analyses and one RCT met the criteria. Only the RCTs not summarized in the meta-analyses were summarized in this review. Results were mixed for all interventions. Statistically significant reductions in NPI were shown in all three studies on Ginkgo, two of the studies on aromatherapy, and two of the studies on exercise.

Conclusion: This review identifies gaps in the literature in developing nonpharmacological supports for people with BPSD. Evidence suggests statistically significant benefits of Ginkgo extract, exercise, and aromatherapy. More research is needed especially on safety, standard dose, and method of intervention delivery. Overall, this points to a need for future research in nonpharmacological interventions to support people living with dementia.

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

Conflicts of Interest: The authors have no conflicts of interest to declare.

The Role of Olive Oil and Its Constituents in Mental Health: A Scoping Review

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Background: Mental illnesses, such as depression, anxiety, schizophrenia, and bipolar disorder, significantly affect an individual's quality of life and emotional, cognitive, and psychological well-being. The prevalence of mental illness is increasing, making it a public health concern. The Mediterranean diet has been comprehensively studied regarding its benefits on mental health; however, less is known about the individual diet components which contribute to the therapeutic effect. Olive oil has an abundance of health benefits. A longstanding wealth of literature supports olive oil's benefit on cardiovascular health, but its impact on mental health has not been reviewed systematically.

Methods: PubMed and OVID MEDLINE databases were searched to identify articles assessing an association between olive oil and mental health conditions. Included in the scoping review were studies that delivered or measured intake of olive oil or one of its constituents. Any outcome measures related to mental health were considered, including incidence, severity, and treatment of mental disorders. The following article types were eligible for inclusion: human experimental and observational studies, animal and preclinical studies, and meta-analyses. Abstracts were screened in duplicate and data were extracted using a piloted template. Data were analyzed qualitatively to assess trends and gaps for further study.

Results: The PubMed and OVID MEDLINE search yielded 544 and 152 results, respectively. After deduplication, 552 results remained. After full text screening, 32 studies were eligible for inclusion, including 4 human experimental, 18 observational and 10 animal studies. Observational studies showed varying results, with some showing an increase in symptoms, some showing a decrease, and some showing no impact on mental health with higher intake of olive oil or levels of oleic acid. All human experimental studies and 10 of 11 animal studies showed an improvement of anxiety and/or depression symptoms with olive oil supplementation.

Discussion/Conclusions: A deeper understanding of the impact diet patterns, foods, and constituents have on mental health is crucial. Based on these findings, olive oil may benefit mental health outcomes. However, due to the small number of experimental studies, differences between studies in dose, duration, and outcome, more research is needed.

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

Conflicts of Interest: The authors have no conflicts of interest to declare.

The Effectiveness of Mistletoe Injections, Ketogenic Diets, and Yoga on the Quality of Life of Breast Cancer Patients Undergoing Conventional Treatment: A Narrative Review

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Background: Breast cancer is the leading cause of cancer in women and is estimated to affect 1 in 8 Canadian women. Conventional treatment, though it is often effective and increases survival, can result in significant adverse effects and

impairments in quality of life (QoL). The purpose of this review is to analyze current research on the potential of adjunctive practices to improve QoL in breast cancer patients undergoing conventional treatment. Mistletoe injections, ketogenic diets, and yoga were chosen based on their popularity as adjunctive interventions for cancer patients.

Methods: PICO criteria were defined prior to conducting the literature search: 1) the study population was breast cancer patients undergoing conventional oncology treatment, 2) the intervention was mistletoe subcutaneous injections, ketogenic diets, or yoga, 3) the control was conventional oncology treatment only, and 4) the EORTC-QLQ C-30 assessment of QoL was an outcome measure. The search was limited to the PubMed, Google Scholar, and Cochrane Library. Search parameters of clinical trial, meta-analysis, and randomized controlled trial were applied.

Results: The literature search for mistletoe yielded 101 studies, of which three RCTs met the criteria. Ketogenic diets yielded 149 studies of which three RCTs met the criteria. Yoga yielded 669 studies of which two RCTs and one meta-analysis met the criteria. All nine studies showed improvements in QoL, although not statistically significant in all trials. Improvement in the role functioning and pain subscales reached statistical significance in all mistletoe trials. Two ketogenic diet study demonstrated statistically significant improvement though not in all subscales. Global QoL significantly improved in two yoga trials.

Conclusion: Mistletoe, ketogenic diets, and yoga are viable adjunctive treatment options for breast cancer patients undergoing conventional treatment to improve aspects of QoL. There is a trend towards improvement in QoL in all interventions, although this did not reach statistical significance in all studies appraised.

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

Conflicts of Interest: The authors have no conflicts of interest to declare.

The Critical Role of Diet in the Prevention and Treatment of Mental Disorders: An Opportunity for the Naturopathic Profession to Positively Impact the Burden of Illness Using a Recently Developed Clinical Tool

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The burden of mental illness is high and currently available treatments do not meet the needs of all people affected. Conventional treatment options for mental disorders are not always accessible, effective, or well tolerated; as such, many individuals seek alternative and complementary therapies. There is emerging and compelling evidence that diet is an important modifiable risk factor in the development and progression of mental illnesses and early evidence suggests that diet modification is an effective therapeutic intervention. However, dietary counselling in the context of mental health care is currently underutilized, including in the delivery of naturopathic care. A recently created clinical tool meant to facilitate dietary counselling in mental health care is presented along with a description of its development and a discussion of barriers. The clinical tool includes a worksheet and clinician guide designed by naturopathic doctors and psychiatrists. It includes diet recommendations, meal suggestions and opportunities for goal setting. Pilot testing of the tool found that people with lived experience with mental illness found it acceptable. There is an opportunity for NDs to use this tool or other resources to support individuals experiencing mental illness through dietary counselling and to be leaders in the use of diet change for the treatment of mental health conditions.

Funding: Funding for this project was provided by the Canadian CAM Research Fund.

Conflicts of Interest: The authors declare no conflicts of interest.

Dietary Counselling Plus Omega-3 Supplementation in the Treatment of Generalized Anxiety Disorder: Qualitative Analysis of the Ease-Gad Pilot Clinical Trial

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Background: Preliminary clinical evidence suggests that diet modification intervention and omega-3 supplementation can improve symptoms of depression. The *Eating and Supplementation for Generalized Anxiety Disorder study* (“EASe-GAD”)

is the first trial to assess the impact of these interventions on anxiety symptoms among people with a clinical anxiety disorder. This randomized, wait-list controlled, pilot study aimed at assessing the feasibility and acceptability of a dietary counselling and omega-3 supplementation intervention delivered to 50 women with GAD. The primary objective of the present follow-up project is to gather and analyze qualitative data about the acceptability, participant experience, impact, strengths, and weaknesses of the EASe-GAD program, as experienced by the study participants, while also identifying opportunities for improvement.

Methods: This study involved the conduct of focus groups to gather qualitative feedback about participant experience. All EASe-GAD participants who consented to being contacted for further research were invited to participate. Three focus groups were completed with a total of 13 participants. The focus groups took place virtually on Zoom and were 60–90-minutes in length. They involved a semi-structured interview approach with a set of pre-determined questions. The sessions were recorded and transcribed for data analysis purposes. Transcription was done using the Zoom function and checked for accuracy by the study coordinator. Transcribed data were analyzed by thematic analysis using direct question and general thematic analysis approaches.

Results: Participants reported a high level of overall satisfaction with the study. They reported a range of components that they found helpful as well as positive outcomes. They reported components of the program that were less enjoyable and opportunities for improvement. Many participants reported that cost implications of a diet intervention were an important consideration.

Discussion: This project provided valuable insight into the participant experience and impact of the pilot program and identified opportunities for improvement when delivered on a larger scale.

Funding: Ekhagastiftelsen.

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

Investigating the Relationship Between Dietary Practices, Microbiome, and Mental Health Outcomes in Complementary and Integrative Health (Cih) Students

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Background: Health professional students encounter alarming rates of anxiety, depression, burnout, and suicidal ideations. However, there is no information regarding students in Complementary and Integrative Health (CIH) programs. CIH programs are unique in their comprehensive training in dietary, lifestyle, and mind-body practices. The International Cohort on Lifestyle Determinants of Health (INCLD Health) is the first longitudinal study of CIH students' lifestyle, health, and biological markers. The microbiota-brain-gut axis (MGBA) has emerged as a bidirectional communication system between the gastrointestinal tract and the central nervous system, with nutrition playing a pivotal role in modifying the microbiome. To date, no studies have investigated dietary practices among CIH students and their impact on mental health and microbiome.

Objectives: This study aims to characterize dietary practices among CIH students and investigate their relationship with microbiome profiles and mental health outcomes.

Methods: Drawing from the data in the INCLD Health study, this research will present descriptive metrics for dietary practices among CIH students. It will investigate the correlation between these practices (independent variables) and both the microbiota profile and mental health outcomes (dependent variables) through the application of linear regression models. Various models will be introduced in the analysis to account for established confounding factors such as smoking, drug use, sex, age, and others.

Results: Data coding and cleaning has been complete. The remainder of the analysis is still in progress.

Conclusion: This study is the first to explore the specific dietary practices among CIH students and their potential impact on the microbiome and health. The findings will contribute valuable insights into the role of the microbiome in mental health outcomes. As this research is a work in progress, ongoing analyses will provide further depth to our understanding of the intricate connections between dietary choices, microbiome composition, and mental health outcomes.

Funding Sources: Helfgott Research Institute of the National University of Natural Medicine.

Conflicts of Interest: The authors have no conflicts of interest to declare.

Gutpda Study Protocol—Targeting Maternal Gut Microbiome to Improve Mental Health Outcomes: A Pilot Feasibility Clinical Trial

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Background: Perinatal depression and anxiety (PDA) is prevalent and affects millions of mothers worldwide. Changes in the maternal microbiome have been documented, but its relation to PDA remain unexplored. Probiotics and fish oil have each demonstrated positive impact on anxiety /depression and microbial profile in non-pregnant adults. Oily fish are a source of Omega-3 Fatty Acids (O3FAs). Demand for O3FAs increases during pregnancy, and women with lower levels are reported to have increased risk for depressive symptoms. Probiotics have only recently gained attention in the treatment and prevention of mental health disorders. No studies have investigated the interaction between both supplements & dietary counselling in women at risk of PDA.

Objective: Understand the ease and challenges of implementing dietary and supplemental interventions targeting the microbiome of pregnant women at risk of experiencing PDA.

Methods: This is a single-center, partially randomized, placebo controlled, double blind trial with three intervention and one active control arms. A total of 100 pregnant women, with a history of depression/anxiety/PDA, attending Sunnybrook Hospital clinics will be randomized/assigned to one of four study arms. The following interventions are given in each group: Gutopia (dietary counselling +Probiotics + Fish oils), Gutboost (Fish oil and Probiotic), Gutless (Fish oil + Placebo), Active Control (standard care at Sunnybrook). Six study visits (2 during pregnancy and 4 in the postpartum period) must be completed. At each visit women will provide a stool sample, dietary and mental health data. The primary outcomes are recruitment rate, and completion of at least four study visits by each participant.

Results: This study has received REB approval from both institutions, as well as Health Canada approval. The trial is expected to move to recruitment phase by April 2024.

Discussion: The study has received REB approval from CCNM and Health Canada Approval and awaiting Sunnybrook's REB approval.

Funding Sources: The study is funded by Lotte & John Hecht Memorial Foundation.

Conflict of Interest: Dr. Ebrahimi's salary is supported by Atrium Innovations. Study supplements are provided through in-kind support by Atrium Innovations.

The Impact of Interior Built Environment on Student and Employee Experience and Wellbeing: A Review

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Background: In considering the whole patient, naturopathic physicians pay attention to the patient's context, including their physical, natural, and social environments. The relationship between the built environment and human health is complex, but has implications for physical, cognitive, emotional, and social wellbeing. This review examines the impact of non-structural interior elements on mental health and wellbeing, stress management, cognitive function, and academic and work performance with a focus on the relevance of these findings for student and employee wellness within educational institutions.

Methods: A search was performed in PubMed, CINAHL, Web of Science Core Collection, APA PsycInfo, and APA PsycARTICLES databases to identify review articles mentioning the impact of interior/indoor built environments on mental wellness, mental health, stress management, academic and work performance, or cognition. All studies were screened and extracted in duplicate using Covidence.

Results: A total of 6,495 studies were screened and 80 studies met the inclusion criteria. Non-structural interior elements such as colour, lighting, shape, temperature, spatial arrangement, furniture, sound, air quality, art, and plants and other nature-based elements were found to have associations with various aspects of mental health and wellbeing, cognition, stress, and academic and work performance. The studies included within the reviews demonstrated a wide range in study quality, context, and methodological design.

Discussion: This project increases our understanding of the impact of the interior built environment on wellbeing and performance and provides a starting point for guiding interior design choices in academic and professional work environments. The wide variation in studies makes it challenging to assess overall impact. The focus on singular aspects of the environment leaves room for future studies addressing the impact of these interior elements in combination. Going forward, interdisciplinary collaboration between healthcare and design professionals has the potential to result in indoor environments that promote wellbeing and improve performance.

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

Conflicts of Interest: The authors have no conflicts of interest to declare.

Naturopathic Approaches to Atopic Dermatitis: A Cross-Sectional Audit of Patient Care at a Naturopathic Teaching Clinic

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Background: It is estimated that up to 17% of Canadians will suffer from atopic dermatitis (AD) at some point in their lives. In Ontario specifically, patients with AD have an average of 3.6 publicly funded doctor visits per year to assess and treat their AD. The total cost of AD in Canada is estimated to be 1.4 billion Canadian dollars annually. Given this burden, there is a growing interest in the use of complementary and alternative medicines (CAM) as an adjunct to conventional treatment for AD. Up to 34% of patients will seek out and use CAM therapies at some point to treat their AD, however less is known about the nature of the care that is being provided by CAM professionals, including naturopathic doctors. Therefore, this study aims to describe the different therapies used by naturopathic doctors to support patients with AD. This research may provide useful information in the development of standards of care and practice guidelines for the holistic treatment of AD.

Methods: Electronic medical charts from the Robert Schad Naturopathic Clinic (RSNC) were reviewed for demographics, treatments, compliance, and response to treatment. Charts were selected by searching the electronic medical record system of the RSNC between May 1st, 2018 and Dec 31st, 2022 for patients with atopic dermatitis in their charted assessment (ICD9 Code 691). Records were excluded if they did not have at least three visits during the date range specified or were under 18 years of age at the time of their first appointment. Manual extraction was done by one individual using a pilot-tested template to describe the nature of the conditions, laboratory investigations, and treatments provided. This study was approved by the Canadian College of Medicine's Research and Ethics Board.

Participants: A total of 372 charts were identified in the electronic medical record system. Screening and data extraction are ongoing.

Results: Data will be presented that outline the percent of records that met the inclusion criteria, general information about demographics, the average number of treatments patients came in for, as well as the clinical severity assessments, conventional treatments, and therapies (including lab assessments, NHPs, lifestyle recommendations, TCM and acupuncture, botanical medicine and homeopathy) prescribed by naturopathic doctors at the clinic.

Conclusion: Conclusions are still pending. This cross-sectional audit will reveal common patterns in assessment, management, and treatment of AD, and may provide a foundation for establishing best practices, guidance or education for treating patients presenting with these concerns that is inclusive of the care being provided by naturopathic doctors.

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

Conflicts of Interest: The authors have no conflicts of interest to declare.

Evaluating the Impact of Tai Chi on Hypertension: A Narrative Review

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Background: Hypertension is a risk factor for future cardiovascular disease and mortality. Hypertension is a very common clinical presentation yet remains underdiagnosed. Many pharmaceutical options exist but they are not free of adverse effects. Exercise is a common recommendation given to individuals suffering from hypertension. Altered functional mobility may limit which exercises can be performed, especially with weight-bearing exercises. Tai Chi is a meditative movement therapy

that has been found to be safe, gentle, and inexpensive and can be performed by all age groups and body types. The goal of this review is to evaluate the evidence related to the effect Tai Chi has on blood pressure in hypertensive adults.

Methods: The following criteria were defined prior to the literature search in PubMed, ResearchGate, and Google Scholar: 1) humans with hypertension, 2) intervention researched was Tai Chi, 3) comparison was placebo or control movement, and 4) outcomes included systolic and diastolic blood pressure. Inclusion was limited to randomized control trials (RCTs) and systemic reviews with meta-analyses. Only trials not included in the summarized systematic reviews and meta-analyses were included.

Results: The literature search for hypertension and Tai Chi yielded 27 results out of which 10 met the inclusion criteria. All 10 of the included studies reported statistically significant reductions in systolic and/or diastolic blood pressure.

Conclusion: The evidence reviewed suggests that performing Tai Chi decreases systolic and diastolic blood pressure. More research needs to be conducted regarding the effect of these interventions on decreasing blood pressure and by extension cardiovascular disease.

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

Conflicts of Interest: The authors have no conflicts of interest to declare.

Evaluating Aerobic Exercise for Primary Insomnia: A Narrative Review

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Background: Primary insomnia is a sleep disorder characterized by persistent difficulties in falling asleep, staying asleep, or achieving restorative sleep, without the presence of any underlying medical, psychiatric, or environmental cause and can significantly impact an individual's quality of life. Drug options exist, but due to the chronic nature of primary insomnia, dependence can occur with long-term use. This study aims to evaluate the effects of aerobic exercise on sleep quality in people with primary insomnia.

Methods: PICO criteria were defined before conducting the literature search: 1) study populations had to be comprised of adults with primary insomnia, 2) the intervention had to include aerobic exercise, 3) there had to be a control group that was either placebo or no-activity, and 4) PSQI or ISI had to be one of the outcome measures. The search was limited to randomized controlled trials (RCT) and meta-analyses in the PubMed database and the human filter applied. Only trials not included in the summarized systematic reviews and meta-analyses were included.

Results: The literature search for aerobic exercise yielded 23,446 studies of which two RCTs and two systematic reviews with meta-analyses met the criteria.

All four studies demonstrated that moderate to vigorous aerobic exercise had statistically significant reductions in subjective outcome measures related to the severity of primary insomnia in adults according to the PSQI or ISI. Other sleep parameters demonstrated amelioration following an exercise program; however, this differed between studies. Exercise duration, type, and frequency varied between studies. No adverse effects were reported in any of the studies following the use of aerobic exercise as a therapeutic intervention. Comparator interventions also had no report of adverse effects.

Conclusion: Aerobic exercise appears to be a viable treatment option for adults with primary insomnia. Further studies investigating variations in duration, frequency, and intensity are needed to establish standards for optimal patient outcomes.

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

Conflicts of Interest: The authors have no conflicts of interest to declare.

Evaluating Yoga as Adjunctive Treatment in the Management of Type 2 Diabetes: A Narrative Review

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Background: Approximately 462 million individuals are diagnosed with type 2 diabetes mellitus (T2DM) globally. T2DM is a chronic metabolic disorder characterized by hyperglycemia which if left untreated may result in target organ damage. Treatment is commonly a combination of pharmacological therapy and lifestyle interventions; however, these are not without adverse effects. This study will explore the efficacy of yogic practice for the adjunctive management of T2DM.

Methods: PICO criteria were defined prior to conducting the literature search: 1) population of adults diagnosed with T2DM, 2) yoga was used as intervention, 3) placebo comparator group, and 4) outcome measure of interest was fasting blood glucose (FBG). PubMed, Medline and Web of Science were used to conduct the literature search. The search limited all published

articles between 2002–2023 in English and included only RCTs and systematic reviews with meta-analysis using human subjects only.

Results: The literature search for yoga yielded 337 studies of which two RCTs and one systematic review met the criteria for inclusion. The two included RCTs were not captured within the included systematic review. Across all three studies, the duration of yoga treatment ranged from 10 weeks to 6 months with sessions ranging from 45–120 minutes for 1–7x/week. Sessions consisted of warm-up exercises, breath control, stretch relaxation postures, and abdominal exercises. All three studies reported a statistically significant reduction of FBG values in the yoga group compared to placebo. The magnitude of effect across all three studies reported as a weighted mean difference between yoga and the control group ranged between 0.92 mmol/L–3.9 mmol/L.

Conclusion: This review supports the use of yoga as an adjuvant treatment for patients with T2DM. Future studies need to recruit larger sample sizes and expand the ethnic diversity of participants.

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

Conflicts of Interest: The authors have no conflicts of interest to declare.

Dietary Counselling Plus Omega-3 Supplementation in the Treatment of Generalized Anxiety Disorder: Results of a Randomized Wait-List Controlled Pilot Trial (The “Ease-Gad Trial”)

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Background: Anxiety disorders are prevalent and disabling conditions. Clinical evidence suggests that nutrition interventions, based on the Mediterranean diet and supplementation of omega-3 fatty acids, can significantly improve symptoms of major depressive disorder; however, the effect of nutrition interventions on clinical symptoms in individuals with anxiety disorders has not been studied. The primary objective of the present study was to assess the feasibility and acceptability of a dietary counselling and omega-3 fatty acid supplementation intervention. The secondary objectives included assessing changes in anxiety symptom severity, diet quality, self-efficacy, mindful eating, quality of life, and biomarkers.

Methods: This study was a randomized, wait-list controlled pilot trial delivering a 12-week, biweekly dietary counseling intervention and omega-3 supplementation to 50 adult women with GAD. Participants completed seven individual counselling sessions which included nutrition education, personalized recommendations, mindful eating techniques, motivational interviewing, and goal setting. Questionnaires and blood work were completed at baseline, after the wait period (for those in the waitlist group) and after the intervention.

Results: A total of 443 individuals contacted the study within seven months; 50 met criteria for enrollment. The two most common reasons for ineligibility included high baseline diet quality (n=151) and low baseline anxiety symptom severity (n=103). The mean number of sessions attended was 6.4 of 7. Three participants self-withdrew before starting the program and one was lost to follow up. Final questionnaires were completed by 46 of 50 participants. Eighty-four percent of participants reported that they strongly agreed with the statement “My experience during this study was positive”. The change in mean anxiety symptom severity score during the intervention period was 26.2 (95%CI 22.94–29.48) to 11.0 (95%CI 8.05–13.87) and during the waitlist period was 29.3 (95%CI 24.73–33.91) to 26.8 (95%CI 22.09–31.56). Diet quality score increased from 7.2 (95%CI 6.32–8.10) to 10.5 (95%CI 9.55–11.49) and OmegaScore increased from 3.58 (95%CI 3.29–3.87) to 7.18 (95%CI 6.35–8.01) during the intervention period.

Discussion: Based on pre-specified criteria, this study was both feasible and acceptable. Participation in the intervention was associated with a decrease in anxiety symptoms, an improvement in diet quality and an increase in OmegaScore. These findings lay the foundation for future large-scale studies in this area.

Funding Sources: Ekhagastiftelsen, Mitacs, AquaOmega, LipidAnalytical, Sobeys.

Conflicts of Interest: The authors have no conflicts of interest to declare.

Maternal Fiber Intake and Perinatal Anxiety and Depression: A Review

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Background: Dietary fiber can significantly alter gut microbiota composition. The role of gut microbiome in the Gut-Brain Axis and modulation of neuropsychiatric disease is increasingly recognized. The role of antenatal diet, particularly fiber intake, in mitigating maternal mental health disorders remains unexplored. The objective of this review is to investigate the association between maternal fiber intake and perinatal depression and anxiety (PDA).

Methods: A literature review of PubMed and Google Scholar was conducted using appropriate keyword/MeSH terms for pregnancy, diet, fiber, and mental health. Observational and clinical trials published between 2015–2021 were included and data pertaining to dietary patterns (DP), food intake, mental health, and demographic data were extracted. The top three fiber-containing food groups (FG) per study were identified using a sum rank scoring system of fiber per 100 grams and fiber per serving size. The consumption of these top three fiber FGs was then ranked for each dietary pattern/group. Mental health outcomes for each study were simplified into three categories of improved, no change, and worsened. The relationship between top three fiber FGs consumed within each DP and mental health outcomes was analyzed using Spearman's Correlation.

Results: Thirteen of 52 studies met inclusion criteria. Ten (76.9%) studies assessed DPs (7 examined depression only, two examined depression and anxiety, and one examined anxiety only). Seven (54.9%) studies reported at least one significant positive relationship between mental health outcomes and DPs while 3 (23.1%) reported at least one negative outcome. Three (23.1%) studies compared intake of different food groups between depressed and non-depressed groups. In studies of DPs, the average consumption ranking of the top 3 fiber FGs, bore a significant inverse association with mental health outcomes ($r=-0.419$ (95%CI: -0.672,-0.078)) $p=0.015$.

In studies comparing intake of different FGs between depressed and non-depressed groups, consumption of top-ranking fiber foods was higher in the non-depressed groups, but significantly higher in four of the ten high fiber FGs.

Conclusion: This study reframes findings from recent published studies of maternal diet and mental health outcomes to focus on fiber intake specifically, using a fiber ranking system. A significant correlation between lower intake of fiber and poorer mental health outcomes warrants further investigation in future studies.

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

Conflicts of Interest: The authors have no conflicts of interest to declare.

Current Perceptions and Attitudes Towards Vaginal Seeding in Health Care Practitioners: A Narrative Review

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Background: Vaginal seeding (VS) is a microbial restoration procedure applied to babies born via cesarean section (C/S). The process involves transfer of vaginal secretions via a sterile gauze to a newborn's mouth, face and body. It is thought that VS may counteract health outcomes associated with C/S such as obesity, autoimmune disease, and asthma. The American College of Obstetricians and Gynecologists (ACOG) however does not recommend VS outside of the context of institutional review board-approved research protocol. As research supporting the benefits of VS emerges, there is an increased interest amongst obstetricians, midwives, doulas, and nurses for the application of VS to C/S delivered babies. Current gaps in knowledge on long-term outcomes, cost, safety, and challenges of VS preclude wider clinical application.

Objective: We aim to explore the current literature and guidelines outlining the perceptions and recommendations surrounding the microbial restoration practice of VS.

Methods: We conducted a literature review using Google Scholar, EMABSE, and PubMed, using keywords related to [Vaginal Seeding, Vaginal seeding safety, Vaginal microbial restoration and restoring microbiome] AND [midwives, obstetricians, delivery nurses, doulas] AND [perceptions, attitudes, opinions], to identify papers that provided data on the practice of VS. Inclusion criteria were clinical trials, surveys, scoping and systematic reviews. Exclusion criteria were articles published before 2004, randomized controlled trials (RCTs) and meta-analyses. Screening against these criteria occurred at abstract and titles, and full text publications were searched to ensure the inclusion and exclusion criteria were met.

Results: Upon conducting a comprehensive search across scholarly databases using pertinent keywords, nine articles met inclusion criteria. Upon full text review, seven articles were further excluded as they did not contain relevant information regarding perceptions, opinions or attitudes related to vaginal seeding and were observing the clinical efficacy of VS. The first article included in this review documented findings from an online survey of pregnant women in New Zealand to gauge their views on VS, considering this article pertained exclusively to the views of pregnant women, its applicability to HCPs renders unsuitable. The second study explored the perspectives of VS among Western Australian midwives. Our findings highlight a notable lack of published surveys on HCPs' perceptions and attitudes on VS. Our investigation of the literature on vaginal seeding revealed a limited number of randomized controlled trials (RCTs) amounting to only three publications encountered during our narrative review.

Conclusion: The limited evidence emphasizes the need for further research on VS. The implications of these findings demonstrate that the limited data on VS is also influencing the HCP's approach to deliberating, recommending, and implementing the practice in clinical settings.

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

Conflicts of Interest: The authors have no conflicts of interest to declare.

The Efficacy of *Boswellia Serrata* on Managing Osteoarthritis in Adults: A Narrative Review

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Background: Osteoarthritis (OA) affects 27% of the population, but its prevalence is on the rise due to lengthened average lifespans and an all-time high in obesity. As a condition marked by joint stiffness, pain, and dysfunction, it is no surprise OA is the leading cause of disability worldwide and consequentially the greatest contributor to sick leave and inability to work. However, OA is also linked to sleep disruption, reduced mood, increased suicide ideation, and a higher risk for developing coronary artery disease and experiencing a myocardial infarction. Management strategies are important to reduce the burden of OA on quality of life, but also the health care system and economy. The American College of Rheumatology and Arthritis Foundation recommends nonpharmacologic interventions as first-line therapy because it more appropriately addresses the underlying biochemical and inflammatory changes that constitute OA.

Methods: PICO criteria that guided the literature search included the following: P) adults with osteoarthritis, I) *Boswellia serrata*, C) placebo, and O) changes to WOMAC scores as one of the outcomes. The search was limited to PubMed, Medline with full text, CINAHL complete, and Cochrane databases and a 10-year date range was applied.

Results: The literature search for *Boswellia serrata* yielded two RCTs and one systematic review and meta-analysis that met criteria. The RCTs included in this review were not summarized within the systematic review and meta-analysis. All three studies reviewed exhibited statistically significant improvements to WOMAC scores for pain, stiffness, and function. The efficacy of *Boswellia serrata* on managing OA symptoms was dependent on the type of boswellic acid extract used, the dose, and the duration of use.

Conclusion: This evidence suggests *Boswellia serrata* may be an effective nonpharmacologic intervention to improve daily function while reducing pain and stiffness in individuals with OA. Further studies with larger sample sizes are needed to strengthen recommendations around optimal dosing and selecting the most effective type of boswellic acid extract.

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

Conflicts of Interest: The authors have no conflicts of interest to declare.

Evaluating the Effects of Ivy Gourd, Chromium, and Berberine in Adults with Type 2 Diabetes Mellitus: A Narrative Review

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Background: Type 2 Diabetes Mellitus (T2DM) cases have risen dramatically in Canada with approximately 11.7 million living with diabetes or prediabetes. It is estimated that diabetes care amounts to \$30 billion per year. Many pharmaceutical antihyperglycemic options exist but they are not without adverse effects. The aim of this study is to evaluate the antihyperglycemic effects of three non-drug pharmacologic interventions, ivy gourd, chromium, and berberine.

Methods: PICO criteria were defined before conducting the literature search: study populations had to be comprised of adults with T2DM, 2) interventions of ivy gourd (*Coccinia* genus), chromium, or berberine, 3) there had to be a placebo control group, and 4) fasting glucose values had to be one of the outcome measures. The search was limited to English-language randomized controlled trials (RCT) and meta-analyses in the PubMed database. Only trials not included in the summarized systematic reviews and meta-analyses were included.

Results: The literature search for ivy gourd yielded 13 studies, of which three RCTs met the criteria. Chromium yielded 335 studies, of which two meta-analyses and one RCT met the criteria. Berberine yielded 263 results, of which one meta-analysis and one RCT fit the criteria. All three of the *Coccinia* and berberine studies displayed a statistically significant reduction in fasting glucose. One meta-analysis and one RCT of chromium found a statistically significant reduction in fasting glucose that varied based on source.

Conclusion: The evidence demonstrates that berberine is a reliable option for improvement of fasting glucose in adults with T2DM. The research on chromium was contradictory, where specific forms showed significant reduction in fasting glucose in some studies but not all (brewer's yeast and chromium picolinate). Ivy gourd does show promise as an option for reducing fasting glucose, but further research is needed to determine the reliability and validity of this botanical, as well as therapeutic doses.

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

Conflicts of Interest: The authors have no conflicts of interest to declare.

Appendix: [Research Posters](#)

Conflicts of Interest

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

Authors' Contributions

MA and KC co-founded the first CCNM Research Day.

MA, DB, TT, MA, NE, and 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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