

## The 7th Annual CCNM Research Day: Student Research & Innovation in Naturopathic Medicine



Rebecca Lester, BSc [1] Tiffany Turner, ND [1], Monique Aucoin, ND, MSc [1,2], Neda Ebrahimi, PhD [1], Kieran Cooley, ND [1,3-5]\*



[1] Canadian College of Naturopathic Medicine, Ontario, Canada M2K 1E2

[2] University of Guelph, Guelph, Ontario, Canada N1G 2W1

[3] University of Technology Sydney, Ultimo, Australia

[4] Pacific College of Health Sciences, San Diego, USA

[5] National Centre for Naturopathic Medicine, Southern Cross University, Lismore, Australia

\*Corresponding Author: [kcooley@ccnm.edu](mailto:kcooley@ccnm.edu)

### Abstract

The following are abstracts from the research competition at the 7th 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, mindfulness

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**Note:** Research posters associated with this conference abstract book are available as a [supplementary file](#).

## Conference Abstracts

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### **Berberine supplementation in polycystic ovarian syndrome: A narrative review**

*Nour Abu Najisa, CCNM Student [1], Adam Gratton, MSc, ND [1]*

*[1] Canadian College of Naturopathic Medicine, Toronto, Ontario, Canada*

**Background:** PCOS is an endocrine disorder that affects 116 million pre-menopausal women worldwide. It is commonly characterized by 2 of the following: hyperandrogenism, anovulation, or polycystic ovaries. Insulin resistance plays a significant role in the manifestation and progression of PCOS. PCOS is treated symptomatically with hormonal and glycemic modulating medications to help regulate menstrual cycles and address underlying insulin resistance. Berberine (BBR) is an isoquinoline alkaloid and has been shown to affect insulin, glucose, lipid, and hormonal regulation. This review aims to determine the effects of BBR on metabolic and hormonal parameters in people with PCOS.

**Methods:** PICO was defined before conducting the search on PubMed, Google Scholar and Science Direct. Population included people diagnosed with PCOS based on Rotterdam criteria. Intervention was BBR at a dose of >300 mg. Comparator group was placebo and/or metformin. Outcome measures were divided into 4 categories: clinical characteristics, hormonal parameters, metabolic parameters, and lipid profiles. Limits were used to refine results to publication dates between 2010-2022, randomized control trials, systematic reviews, and meta-analyses.

**Results:** The literature search yielded a total of 192 studies of which 4 RCTs and 2 systemic reviews with meta-analysis met the inclusion criteria. From the 2 systemic reviews, 4 RCTs met the criteria yielding a total of 8 RCTs. The overall trend among all 8 RCTs showed that BBR had similar favorable effects on metabolic and hormonal parameters when compared to metformin. However, berberine demonstrated superiority over metformin on lipid parameters and body fat composition. BBR showed a greater impact on all 4 outcome parameters when compared to placebo.

**Conclusion:** Evidence suggests that BBR is a promising treatment for PCOS acting through mechanisms of decreasing blood sugar, insulin resistance, and androgen level as well as improving dyslipidemia. Further research with larger sample sizes and representation of various ethnic backgrounds is warranted.

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

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

### **Investigating acupressure, vitamin E and aerobic exercise for relieving pain in primary dysmenorrhea: A narrative review**

*Domenique Barbaro, CCNM Student [1], Adam Gratton, MSc, ND [1]*

*[1] Canadian College of Naturopathic Medicine, Toronto, Ontario, Canada*

**Background:** Primary dysmenorrhea (PD) is the most common gynecological condition amongst women of reproductive age. It affects between 45-95% of women that menstruate. It is defined as having spasmodic pain originating from the uterus in absence of underlying pelvic pathology. Despite its high prevalence, it is often mistakenly accepted as a normal aspect of a menstrual cycle. First-line therapies emphasize the use of non-steroidal anti-inflammatory drugs and hormonal contraceptives; however, these involve adverse effects such as the increased risk of breast cancer and gastrointestinal disturbances. This review will investigate the role of specific natural interventions, namely acupressure, vitamin E and aerobic exercise for primary dysmenorrhea.

**Methods:** A PICO framework was defined prior to conducting a literature search: 1) the population was females with PD, 2) intervention of acupressure, vitamin E, or aerobic exercise, 3) comparison to placebo, and 4) the outcome measure was pain intensity measured by a visual analogue scale (VAS). The search was limited to meta-analyses and randomized controlled trials and the human filter was applied.

**Results:** A literature search in PubMed and Google Scholar yielded 43, 47 and 52 results for acupressure, vitamin E and aerobic exercise, respectively and 3 RCTs met the criteria for each intervention. All studies demonstrated a statistically significant reduction in pain in comparison to placebo. The method of intervention varied across studies. Acupressure points included liver 3, spleen 6 and auricular points, vitamin E dosage ranged from 200-500IU, and aerobic exercise ranged from 45-60 minutes 3-5 times per week.

**Conclusion:** Acupressure, vitamin E, and aerobic exercise may be useful natural therapies for women with PD. Additional research with larger sample sizes and longer study durations is needed to strengthen the quality of evidence and more confidently determine the magnitude of benefit.

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

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

### **Investigating antioxidant supplementation to improve sperm quality: A narrative review**

*Taylor Brohm, CCNM Student [1], Adam Gratton, MSc, ND [1]*

*[1] Canadian College of Naturopathic Medicine, Toronto, Ontario, Canada*

**Background:** Infertility affects 15% of couples worldwide, and male-factor infertility is believed to contribute to 50% of these cases. Achieving optimal sperm quality could prevent many couples from undergoing assisted reproductive therapies. Environmental and lifestyle factors are thought to impact fertility by decreasing the number and quality of gametes via oxidative stress mechanisms which increase reactive oxygen species (ROS) in semen. Increased seminal ROS may damage sperm and is seen in 30-80% of subfertile men. This suggests a potential role of antioxidant supplementation in improving sperm quality.

**Methods:** The following criteria were defined to conduct the literature search: 1) population includes subfertile, reproductive-aged males; 2) intervention of either vitamin E, L-carnitine (LC) & L-acetyl-carnitine (LAC), or docosahexaenoic acid (DHA) supplementation; 3) placebo control group; and 4) change in semen parameters as outcome. PubMed was the primary database searched and results were limited to systematic reviews with meta-analyses and RCTs. Only RCTs not included in selected meta-analyses were included.

**Results:** The literature search for vitamin E studies yielded 35 results, LC/LAC yielded 32 results, and DHA studies yielded 7 results. The final result was 1 systematic review with meta-analysis and 2 RCTs for each intervention. Supplementation of Vitamin E (alpha-tocopherol) improved total sperm count, concentration, and progressive motility compared to placebo. LC and LAC supplementation improved total and progressive sperm motility and sperm morphology. Supplementing subfertile males with DHA modestly improved progressive sperm motility compared to placebo. Most of the studies were small, of low-to-moderate quality, and demonstrated significant heterogeneity in dose and treatment duration.

**Conclusion:** Vitamin E, LC & LAC, and DHA supplementation may have a beneficial role in improving sperm quality in subfertile men. Larger studies with more consistent methodology in dosage and length of treatment should be conducted. Long-term follow-up is needed to determine if antioxidant supplementation increases live birth rates.

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

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

### **Maternal fiber intake and perinatal anxiety and depression: A review**

*Victoria Forte, CCNM Student [2], Tiffany Turner, ND [1], Shabnam Rahdar, CCNM Student [2], Rebecca Lester, CCNM Student [2], Sholeh Ghayoori, CCNM Student [2], Angelica Brigino, CCNM Student [2], Neda Ebrahimi, PhD [2]*

*[1] Canadian College of Naturopathic Medicine, New Westminster, British Columbia, Canada*

*[2] Canadian College of Naturopathic Medicine, Toronto, Ontario, Canada*

**Background:** Nutrition mediates the role of the gut microbiome in neurological health via the gut-brain axis. Specifically, the gut microbiota profile and its metabolic output is highly responsive to diet. The role of antenatal diet, particularly fiber intake, in mitigating maternal mental health disorders remains unexplored.

**Objective:** To investigate the association of fiber intake and perinatal maternal anxiety and depression.

**Methods:** A literature review of PubMed and Google Scholar was conducted using keyword/MeSH terms: [diet, nutrition, dietary pattern, diet quality, fiber, prebiotic, oligosaccharides, complex carbs, prebiotics, symbiotic, fructooligosaccharides, inulin, oligofructose, 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 in pregnant and/or postpartum cohorts were included. Reviews, meta-analyses, studies prior to 2015, animal-based or including other mental health disorder were excluded. Article titles/ abstracts were screened; diet, mental health outcomes and demographic data were extracted.

**Results:** 20 of 52 studies met inclusion criteria, from the following countries: Brazil (2), China (5), Australia (4), Japan (2), Singapore (2), USA (3), and Vanuatu (1). Three studies assessed perinatal depression and anxiety; 4 assessed Antenatal depression (3), and/or anxiety (1); and 11 Postnatal studies assessed anxiety, depression or both. 10 studies compared dietary

patterns and mental health outcomes, while 7 compared intake of food groups in depressed/non-depressed cohorts. Currently, results from Chinese studies have been analyzed; two evaluating dietary patterns noted nuts, legumes and fruits as the highest-ranking fiber foods with highest consumption of at least one of these foods associated with lower odds ratio of depression. A significant decrease in high fiber fruits and vegetables was observed in another study in women with postpartum depression. We observed a lower intake of high fiber foods in the insufficient and imbalanced dietary patterns (cereals/grains, soybean, fruits and vegetables). Both dietary patterns were common in the depressed group.

**Conclusions:** Analysis still in progress.

**Funding Sources:** The study has received no funding. Neda Ebrahimi's position is supported by an arms-length donation from Atrium Innovations.

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

### **Cultural stigma and fertility: A scoping review**

*Navkiran Goraya ND [1], Kieran Cooley, ND [1-4]*

*[1] Canadian College of Naturopathic Medicine, Toronto, Ontario, Canada*

*[2] University of Technology Sydney, Ultimo, Australia*

*[3] Pacific College of Health Sciences, San Diego, USA*

*[4] National Centre for Naturopathic Medicine, Southern Cross University, Lismore, Australia*

**Background:** Infertility is a global health concern with a significant impact on individual mental health and quality of life. However, many individuals trying to conceive often do not seek or receive help due to barriers related to stigmatization. The questions become why and how culture is shaping fertility and can bringing this into awareness help support individuals trying to conceive. This scoping review will aim to identify the existing landscape of evidence and explore common and unique themes at the intersection of cultural stigma in fertility.

**Methods:** A scoping review will be conducted to identify all articles from grey literature and academic databases including a search of PubMed, MEDLINE and EBSCO (CINAHL, PsychInfo) that reference infertility and any psychological or social factors linked to culture or identity. The Arksey and O'Malley framework for scoping reviews will be used to guide methodology. Titles and abstracts will be screened independently and in duplicate against the inclusion and exclusion criteria. Deductive systematic thematic analysis of each article will be employed to identify common themes regarding stigma, disclosure, and care seeking/avoidance. In addition to identified themes, data will be extracted based on research methodology, population studied (location, culture, religion), sex/gender, future work identified and guidance for addressing stigma at the population or clinical levels. 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.

**Results:** Findings are in progress.

**Conclusion:** The results obtained through this scoping review may assist in guiding future initiatives to actively address cultural components of stigma and fertility and may provide a useful tool for collaboration and advancement within this field.

**Funding Sources:** None

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

### **Investigating L-arginine and low-intensity extracorporeal shock wave therapy for erectile dysfunction:**

#### **A narrative review**

*Kiara Kallio CCNM Student [1], Adam Gratton, MSc, ND [1]*

*[1] Canadian College of Naturopathic Medicine, Toronto, Ontario, Canada*

**Background:** Erectile dysfunction is one of the most common sexual health conditions among males. In North America, 40% of men in their 40s are diagnosed with ED. While there are numerous factors that contribute to ED, it is known that the condition has a profound impact on identity, confidence, mental health, and sexual satisfaction. Current treatments for ED range from less invasive prescription drugs to more invasive procedures such as intracavernosal injections and penile implants. Patient willingness to seek treatment is dependent on the level of invasiveness, adverse effects, cost, and how quickly the treatment becomes efficacious, therefore increasing demand for non-pharmacological treatments for ED. This review will assess the clinical efficacy of two non-drug treatments for ED: L-arginine and low-intensity extracorporeal shock wave therapy (LI-ESWT).

**Methods:** The following PICO criteria were defined: 1) population of adult males with mild-to-moderate ED, 2) intervention of L-arginine or LI-ESWT 3) treatment compared to placebo or sham therapy, 4) a primary outcome measure of an increased score in the International Index of Erectile Function (IIEF) or Sexual Health Inventory for Men (SHIM) questionnaires. PubMed, Science Direct, and Google Scholar were used for the literature review of randomized control trials and meta-analyses.

**Results:** The literature search for L-arginine yielded 114 studies, of which three met the criteria. The literature search for LI-ESWT yielded 240 studies, of which three met the criteria. All 6 studies investigating L-arginine and LI-ESWT showed an improvement in erectile function and statistically significant improvements in IIEF and SHIM scores. Doses of L-Arginine ranged from 1.5-5g/day and the treatment protocol for LI-ESWT included, on average, 15-minute treatment sessions with 300-500 shockwaves at each point for a total of 12 sessions.

**Conclusion:** L-Arginine and LI-ESWT are potential treatments for ED. Additional longitudinal studies with larger sample sizes are needed to investigate the long-term effects and optimal treatment protocol for positive clinical outcomes.

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

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

### **Investigating mindfulness practices, aerobic exercise and cognitive behavioural therapy for post-traumatic stress disorder: A narrative review**

*Maurgan LeBlanc, CCNM Student [1], Adam Gratton, MSc, ND [1]*

*[1] Canadian College of Naturopathic Medicine, Toronto, Ontario, Canada*

**Background:** Post-traumatic stress disorder (PTSD) is defined as the development of distressing mental health symptoms including, but not limited to, hyper-arousal, flashbacks, anhedonia, and suicidality, within 3 months following exposure to significant trauma. The lifetime prevalence of PTSD is believed to be 6.8% worldwide, but may be higher in certain populations. Pharmacological interventions are currently recommended for short-term relief of symptoms, however, due to the highly individualized nature of the condition, PTSD can be challenging to successfully treat long-term. Alternative interventions have demonstrated efficacy in treating related mental health conditions, but further analysis specific to their potential in treating PTSD is needed. This review aims to explore the currently available evidence on mindfulness practices, aerobic exercise, and cognitive behavioural therapy (CBT) as singular or concurrent intervention options for PTSD treatment.

**Methods:** A review of the existing literature was conducted in PubMed, PsycARTICLES, and Google Scholar for randomized control trials (RCTs) and meta-analyses. The following inclusion criteria were used: 1) Adults with PTSD. 2) Mindfulness, aerobic exercise, and CBT either alone or in comparison to other non-pharmacologic interventions. 3) Comparison to a waitlist or treatment as usual control group. 4) Reduction in PTSD symptom severity.

**Results:** Three of the 83 available mindfulness studies, three of the 38 available exercise studies, and three of the 168 available CBT studies met inclusion criteria. All included studies found statistically significant reductions in PTSD symptom severity on PCL and CAPS screening measures following intervention, including reduction in individual diagnostic symptom categories, including hyperarousal, avoidance, re-experiencing symptoms.

**Conclusion:** The existing evidence suggests that mindfulness practices, aerobic exercise, and CBT are promising alternative interventions for the treatment of PTSD in adults. Long-term guided mindfulness interventions appear to most significantly reduce PTSD symptom severity and maintain symptom remission post-intervention.

**Funding Sources:** None

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

### **A multi-modal naturopathic approach in a patient with schizoaffective disorder: A case report**

*Rebecca Lester, CCNM Student [1], Jonathan Prousky, MSc, ND, RP [1]*

*[1] Canadian College of Naturopathic Medicine, Toronto, Ontario, Canada*

**Background:** Over 1.5 million Canadians live with schizophrenia and other psychotic disorders, having an extended impact on family members, friends, and the surrounding community. Schizoaffective disorder (SAD) is a chronic mental health condition where the individual experiences schizophrenic symptoms like hallucinations or delusions along with mood disorder symptoms like mania and depression. People living with SAD among other psychotic disorders can experience an inability to perform day-to-day tasks, an overall decreased quality of life, increased risk of physical ailments and lowered life expectancy (5% suicide rate). Research has been conducted on dietary interventions, supplementation, lifestyle counselling and acupuncture with respect to psychotic disorders as independent interventions. No research was found with respect to a

multi-modal/whole systems naturopathic approach to managing schizophrenia spectrum disorders and more specifically SAD.

**Clinical Case:** A middle-aged male with a diagnosis of schizoaffective disorder moved to a new Province in late August. Unable to find a medical doctor, he had to discontinue his monthly injections of Aripiprazole, an atypical antipsychotic. He began treatment at the Robert Schad Naturopathic Clinic (RSNC) in September, and in the three months since we have seen significant improvement in his condition. The naturopathic plan for the patient includes a high-dose micronutrient supplement, omega-3 fatty acids and 5-Hydroxytryptophan (5-HTP). SM also went for weekly appointments at the RSNC for acupuncture and lifestyle counselling. His caretaker was providing him with stable housing, a healthy diet, and almost daily nature exposure. There was a significant decrease in his Patient Health Questionnaire-9 (PHQ-9) score from September-November (i.e., baseline PHQ-9 of 18 to 10 by the end of treatment). Additionally, energy levels have reportedly increased, and there have been remarkable observational developments including an improvement in psychomotor retardation, speech rate, rhythm and tone, and engagement throughout the visits. Since starting treatment, no positive schizophrenia symptoms were reported.

**Conclusion:** This case highlights the positive clinical outcomes that can be achieved from a naturopathic multi-modal approach to treating schizoaffective disorder.

**Funding Sources:** None

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

### **Sensitivity to dairy products: Investigating the role of a casein polymorphism in human health**

*Charlotte Litjens, MSc, CCNM Student [1], Adam Gratton, MSc, ND [1]*

*[1] Canadian College of Naturopathic Medicine, Toronto, Ontario, Canada*

**Background:** Non-lactose sensitivity to dairy products is increasingly implicated in conditions such as irritable bowel syndrome and atopic dermatitis while the evidence for the elimination of dairy products has been controversial. There is mounting evidence that due to genetic polymorphism, casein in milk from most North American cow subspecies (named A1 cows) produces a potentially problematic casein metabolite beta casomorphin 7 (BMC7), which is not produced by digestion of products from traditional cattle breeds in India, Asia, or France (A2). This suggests that there may be a geographical risk. This scoping review aimed to map the literature regarding the health effects of A1 dairy along with the consumption and availability of A2 products.

**Methods:** Three searches were conducted in PubMed: 1) randomized controlled trials (RCTs) comparing health effects of A1 and A2 dairy; 2) animal studies investigating the effects of BMC7; and 3) reports documenting which global regions have traditionally or recently consumed A2 dairy. The inclusion criterion for RCTs was the comparison of A1 dairy with A2 or placebo.

**Results:** Six animal studies proposed mechanisms for BMC-7's effects on the gastrointestinal, endocrine, immune, nervous, and cardiovascular systems and a role in oxidation and methylation. Nine RCTs compared the health effects of A1 and A2 dairy products in humans. Outcomes associated with A2 products included abdominal pain, stool consistency/frequency, intestinal transit time, atopic dermatitis exacerbations, pro-inflammatory markers, serum glutathione levels, and cognitive function. Dairy consumed in India, New Zealand, Japan, and Africa is primarily A2, whereas that in the US, Canada, and Northern Europe is mostly A1. However, markets for A2 milk and cheese are emerging in the US, Canada, and China.

**Conclusion:** While more rigorous controlled trials are necessary, this review suggests that patients may experience fewer negative effects from consuming A2 dairy products, which are becoming more available globally.

**Funding Sources:** None

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

### **Evolution of key themes in the published literature related to animal and plant source foods in regard to environmental health: Review and thematic analysis**

Rylee MacGregor, CCNM Student [1], Omayma Bouziane, CCNM Student [1], Elizaveta Lapshina, CCNM Student [1], Charlotte Litjens, MSc, CCNM Student [1], Anna Bokhanchuk, CCNM Student [2], Tiffany Turner, ND [2]  
[1] Canadian College of Naturopathic Medicine, Toronto, Ontario, Canada  
[2] Canadian College of Naturopathic Medicine, New West, British Columbia, Canada

**Background:** Dietary recommendations are a key component of naturopathic care and as part of this, the environmental impacts of diet may be considered. However, these conversations do not necessarily capture the nuance of food impacts, and origins of promoted positions may be unclear. This study will explore the evolution of themes regarding animal and plant source foods and environmental health in the published literature.

**Methods:** This study will be completed in five parts and is currently ongoing. PubMed/Medline and CINAHL Complete databases were searched for reviews, editorials, commentary, and guidelines published from 2011-2021 that discussed animal or plant source foods and environmental impacts. Part 1 will use open coding to identify themes in a random subset of articles. Part 2 will involve closed coding for the presence of themes identified in Part 1. Part 3 will identify the number of unique original studies used to support the themes in articles from Part 2. Part 4 will review the unique original studies identified in Part 3, by theme. Part 5 will identify gaps in understanding of the interaction between these foods and environmental impacts.

**Results:** The results of this study will reveal themes on the environmental impacts of animal and plant foods, their frequency, the number of unique original studies used to support them, and the general stance of these articles over a decade. The original studies will be assessed for how well they support the theme they were cited for and whether new evidence exists which challenges the original study.

**Discussion:** The present study will highlight the evolution and frequency of key themes and their supporting evidence, to better understand and encourage nuanced discussions surrounding diet and environmental impact.

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

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

### **Investigating the effect of cannabinoids for atopic dermatitis: A scoping review**

Shivangi Maheshwari, CCNM Student [1], Adam Gratton, MSc, ND [1]  
[1] Canadian College of Naturopathic Medicine, Toronto, Ontario, Canada

**Background:** Atopic dermatitis (AD) is a pruritic skin disease that can be chronically inflammatory causing a decreased quality of life. Pathogenesis of AD is associated with alterations in the skin barrier and immune system dysregulation. Topical therapies such as emollients, topical corticosteroids, and topical calcineurin inhibitors are commonly used, however, they have adverse effects and may not completely alleviate symptoms. The endocannabinoid system (ECS) plays a role in regulating skin homeostasis. Cannabinoids (CBD) can be produced by the body itself, however, dysregulation of the ECS can impair skin homeostasis and may contribute to the pathogenesis of AD. The goal of this review is to study the effect of topical CBD interventions and their potential effect on AD.

**Methods:** The following criteria were defined prior to the literature search in PubMed, ResearchGate, and Google Scholar: 1) Animal models of, or humans with, AD, 2) CBD preparation alone or in combination with other products, 3) Placebo or vehicle control, 4) Outcomes related to symptom severity or Scoring Atopic Dermatitis (SCORAD) score. Inclusion was limited to RCTs and systematic reviews with meta-analyses.

**Results:** The literature search for AD and CBD yielded a total of 23 studies of which 8 studies conducted on animals and humans met the inclusion criteria. Four out of the selected 8 studies were conducted on humans where topical CBD formulation in combination with other substances showed a statistically significant decrease in pruritis. Studies compared the use of CBD in combination with other products, like aspartate, and the use of CBD alone. It was found that combination formulations elicited a stronger effect on AD lesions.

**Conclusion:** Evidence from research suggests that topical CBD is effective on its own, however, administration of CBD in combination with other substances has an enhanced benefit. The evidence suggests potential benefits but more research on human participants is needed.

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

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

### **Perinatal diet and offspring anxiety: A scoping review**

Sasha Monteiro, CCNM student [1], Yousef Sadat Nejad, ND [1], Monique Aucoin, ND, MSc [1, 2]

[1] Canadian College of Naturopathic Medicine, Toronto, Ontario, Canada.

[2] University of Guelph, Guelph, Ontario, Canada

**Background:** Health behaviors during pregnancy have an impact on the developing offspring. Dietary factors play a role in the development of mental illness: however, less is known about the impact of diet factors during pre-conception, gestation, and lactation on anxiety levels in offspring.

**Methods:** This scoping review sought to systematically map the available research involving human and animal subjects to identify nutritional interventions which may have a harmful or protective effect, as well as identify gaps. The databases Ovid MEDLINE and Embase Classic + Embase were searched using controlled vocabulary and keywords. Studies investigating an association between any perinatal diet pattern or diet constituent and offspring anxiety were included. The number of studies reporting an association with increased or decreased levels of anxiety were counted and presented in figures.

**Results:** A total of 55,914 results were identified as part of a larger scoping review, after title and abstract screening, 167 studies met the criteria. Following full text screening, 120 articles met the criteria for inclusion.

**Discussion:** A greater intake of phytochemicals and vitamins were associated with decreased offspring anxiety whereas maternal caloric restriction, protein restriction, reduced omega-3 consumption, and exposure to a high fat diet were associated with higher levels of offspring anxiety. Results were limited by a very large proportion of animal studies.

**Conclusions:** Overall, there is preliminary evidence that dietary exposures during the perinatal period may impact offspring anxiety levels. Despite the need for more research in this area, this review highlights the importance of adequate nutrition during the perinatal period. High quality intervention studies involving human subjects are warranted to elucidate the precise dietary factors or constituents that modulate the risk of anxiety in offspring.

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

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

### **Naturopathic approaches for long-term care home residents with dementia: A scoping review**

Lara Janne Morales, ND [1], Ana Ramos [1], Ava Sturm, CCNM Student [1], Ece Toprak, CCNM Student [1],

Paige Weatherbee-Sakr, ND [1], Kieran Cooley, ND [1-4]

[1] Canadian College of Naturopathic Medicine, Toronto, Ontario, Canada

[2] University of Technology Sydney, Ultimo, Australia

[3] Pacific College of Health Sciences, San Diego, USA

[4] National Centre for Naturopathic Medicine, Southern Cross University, Lismore, Australia

**Background:** The majority of older adults living with dementia will eventually require long-term care home support. Guidance on nonpharmacological approaches has been developed to manage cognitive function and dementia-related symptoms in this setting. However, the full breadth of naturopathic interventions has not been examined. The aim of this scoping review is to examine the evidence and role of therapies within the scope of naturopathic medicine for older adults with dementia residing in long-term care homes.

**Methods:** This scoping review was conducted following the Arksey and O'Malley methodological framework. A literature search of PubMed, Web of Science, and EBSCO's CINAHL and Medline databases was conducted from date of inception until 2022 for studies that provided outcome data on relevant therapies within the scope of naturopathic medicine in Canada in adults >60 years old with dementia residing in long term care homes. Articles available in English and full text articles were eligible for inclusion. Extracted data will be independently reviewed, categorized by naturopathic modalities and analyzed using a narrative approach.

**Results:** The initial searches of each database resulted in the following number of articles that formed our dataset: PubMed (525), Web of Science (4,917), CINAHL + Medline (1,407). The titles and abstracts from these articles are currently being reviewed to remove duplicates and irrelevant studies.

**Conclusion:** Naturopathic interventions may offer a complementary or adjunctive therapeutic approaches for dementia care in long term care settings. A more in-depth understanding on the safety and effectiveness of naturopathic interventions will provide the basis for further clinical research.

**Funding Sources:** None

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

### **The effects of mindfulness-based stress reduction programs in perinatal depression: A narrative review**

*Racheal Onah, CCNM Student [1], Adam Gratton, MSc, ND [1]*

[1] Canadian College of Naturopathic Medicine, Toronto, Ontario, Canada.

**Background:** Up to 20% of women have been diagnosed with perinatal depression in North America. Selective serotonin reuptake inhibitors (SSRIs) are the first-line antidepressants used to treat moderate-to-severe perinatal depression. Meanwhile, psychotherapy such as interpersonal psychotherapy and cognitive behavioral therapy are first-line interventions for mild-to-moderate perinatal depression. This review will look at mindfulness-based stress reduction (MBSR) and Mindfulness-Based Cognitive Therapy (MBCT) programs as a way to treat perinatal depression.

**Methods:** The online databases PubMed, Web of Science, and APA PsycARTICLES were used to identify English peer-reviewed journal articles that reported any outcomes on MBSR or MBCT interventions and perinatal depression. The inclusion criteria are (1) the Edinburgh Postnatal Depression Scale (EPDS) must be reported as an outcome measure, (2) papers must be randomized controlled trials or systematic reviews with meta-analyses. In each database, we used a combination of search terms such as “perinatal depression,” “postpartum depression,” “postnatal depression,” “prenatal depression,” “mindfulness-based interventions,” “mindfulness-based cognitive therapy,” and “mindfulness-based stress reduction programs.

**Results:** The literature search yielded a total of 315 papers, and 12 studies fit the inclusion criteria and were selected for this review. Only the RCTs not summarized in the systematic reviews and meta-analyses were summarized in this review. The types of MBSR programs varied in each study, as well as the duration and frequency. All 12 articles reported an improvement in mental and physical health in perinatal women, and 7 studies reported a statistically significant decrease in EPDS scores.

**Conclusion:** Evidence suggests that mindfulness-based practices are effective in reducing the severity of perinatal depression. However, the research quality, and the heterogeneity between MBSR interventions exists between studies. The introduction of MBSR programs may improve depression in this population.

**Funding Sources:** None

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

### **Investigating acupuncture, mindfulness-based stress reduction, and resistance exercise on pain intensity in patients with fibromyalgia: A narrative review**

*Sierra Simpson, CCNM Student [1], Adam Gratton, MSc, ND [1]*

[1] Canadian College of Naturopathic Medicine, Toronto, Ontario, Canada

**Background:** Fibromyalgia (FM) is a complex chronic condition characterized by diffuse musculoskeletal pain which impairs quality of life. The 2010 prevalence of FM in Canadians aged 12 and older was 1.5%, with a higher prevalence among women and adults over the age of 40. There are few evidence-based pharmacologic options for FM, with non-pharmacologic therapies being considered first-line options. The purpose of this study was to evaluate the strength of current evidence for specific non-pharmacologic therapies, acupuncture, mindfulness-based stress reduction (MBSR), and resistance exercise, in the treatment of pain associated with FM.

**Methods:** Inclusion criteria were defined prior to the literature search as: (1) people diagnosed with FM; (2) intervention of acupuncture, MBSR, or resistance exercise; (3) a non-intervention comparative control group (i.e., sham, no treatment, wait-list group); and (4) changes in pain intensity according to the Visual Analogue Scale (VAS). Literature searches were conducted for RCTs and systematic reviews with meta-analyses conducted in humans on PubMed and Omni Academic Search Tool published between 2000 to 2023.

**Results:** The literature search for acupuncture revealed 361 articles, where 2 RCTs and 1 meta-analysis met the criteria. Of the 234 studies found for resistance exercise, 2 RCTs and 1 meta-analysis met the inclusion criteria. The search on MBSR yielded 144 articles, and 2 RCTs met the criteria. Only RCTs not summarized in included meta-analyses were summarized in this review. A statistically significant effect on pain was shown in seven of the studies, with no significant benefit found in 1 study on MBSR.

**Conclusion:** The evidence suggests that acupuncture and resistance exercise may reduce pain in people with FM. The low-to-moderate quality of current evidence prompts the need for future research with higher-quality studies.

**Funding Sources:** None

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

### **Investigating zinc, vitamin D, and N-acetylcysteine supplementation on CD4+ counts in people with HIV:**

#### **A narrative review**

*Vijayalakshmi Subramaniam CCNM Student [1], Adam Gratton, MSc, ND [1]*

*[1] Canadian College of Naturopathic Medicine, Toronto, Ontario, Canada*

**Background:** In 2021, nearly 650 000 people died from human immunodeficiency virus (HIV)-related conditions and about 1.5 million people acquired HIV. HIV invades and destroys CD4+ cells of the immune system and uses them for replication. Measurement of CD4+ cells is a marker for disease progression. Highly active antiretroviral therapy (HAART) is an effective medication treatment standard, but it can lead to resistance and can cause significant adverse effects. Infection alone depletes various nutrients and treatment also contributes to significant oxidative stress. This narrative review will explore the potential impact of nutrient supplementation of zinc, vitamin D, and N-acetylcysteine (NAC) adjuncts to HAART.

**Methods:** PICO criteria were defined prior to conducting the literature search: 1) study population had to be comprised of adults with HIV infection who were on HAART treatment, 2) the interventions of zinc, vitamin D or NAC, 3) placebo control and 4) CD4+ cell counts had to be one of the outcome measures. To find research that matched these criteria, the search was limited to the “HIV” subset of the PubMed database and “Human”, “RCT” and “Meta Analysis” filters were applied.

**Results:** The literature search for zinc yielded 22 studies, of which 3 RCTs met the criteria. Vitamin D yielded 35 studies of which 4 RCTs met the criteria. N-acetylcysteine yielded 10 studies of which 4 RCTs met the criteria. None of the eleven studies showed a statistically significant increase in CD4+ counts compared to placebo. The magnitude of effect and dosages used varied between studies.

**Conclusion:** Zinc, vitamin D, and NAC did not significantly increase CD4+ counts in patients on HAART. Additional studies with larger sample sizes and standardized dosing strategies are needed.

**Funding Sources:** None

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

### **The teaching kitchen landscape in Canada and the United States: A scoping review**

*Gina Brown, ND [1], Tiffany Turner, ND [2], Elise Fair, CCNM Student [2], Neda Ebrahimi, PhD [1],*

*Kieran Cooley, ND [1, 3-5]*

*[1] Canadian College of Naturopathic Medicine, Toronto, Ontario, Canada*

*[2] Canadian College of Naturopathic Medicine, New West, British Columbia, Canada*

*[3] University of Technology Sydney, Ultimo, Australia*

*[4] Pacific College of Health Sciences, San Diego, USA*

*[5] National Centre for Naturopathic Medicine, Southern Cross University, Lismore, Australia*

**Background:** The role of diet and nutrition in the prevention and management of disease is concretely established across all population levels. While many programs exist to enhance the nutrition literacy of participants, there may be an opportunity to promote programs that seek to translate nutritional knowledge on a practical level with the use of teaching kitchens. For this review, teaching kitchens were defined as those that provide hands-on culinary instruction with concurrent education in other domains intended to promote health. The breadth of research on the use of such programs has not been well documented; this scoping review was undertaken to reduce this gap. The objective of this project was to describe the literature on the use of teaching kitchens in Canada and the United States.

**Methods:** A scoping review (Arksey and O'Malley framework) of peer-reviewed and grey literature was conducted to explore the use of experiential culinary programs within Canada and the United States.

**Results:** 1862 articles were retrieved, with 343 studies meeting criteria for inclusion. Data is currently being extracted including location, funding structure, population served, qualifications of those providing intervention, program duration, evaluation method, and process outcomes. Descriptive statistics will be used to interpret and examine data.

**Conclusion:** Preliminary findings suggest that programs combining nutrition education with hands-on, culinary components are being utilized in Canada and the United States in a variety of contexts. Improvements in perceived nutrition and culinary knowledge, food literacy and security, and in the management of a variety of health conditions across multiple demographic groups have been documented in the literature. These findings may assist in guiding future initiatives to actively map teaching kitchen resources in Canada and provide a useful tool for collaboration and advancement within this field.

**Funding Sources:** This project was supported by CCNM's Student Innovation Fund and by an arms-length donation to research by Fullscript.

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

### **Dietary counselling plus omega-3 supplementation in the treatment of generalized anxiety disorder: Protocol for a randomized wait-list controlled pilot trial (the "EASe-GAD Trial")**

Rebecca Lester, CCNM Student [1], Sasha Monteiro, CCNM Student [1], Meagan McLaren, CCNM Student [1], Monique Aucoin, ND, MSc [1,2], Laura LaChance, MD, MSc [3], Inge van der Wurff, PhD [4], Sean Miller [5], Umadevi Naidoo, MD [6], Andrew Jenkins, MSc [8], Kieran Cooley, ND [1, 8, 9, 10]

[1] Canadian College of Naturopathic Medicine, Toronto, Ontario, Canada

[2] University of Guelph, Guelph, Ontario, Canada

[3] McGill University, Montreal, Quebec, Canada

[4] Open University of the Netherlands, Netherlands

[5] Peer Connections Manitoba, Winnipeg, Manitoba, Canada

[6] Harvard Medical School, Boston, USA

[7] Lipid Analytical Laboratory, Guelph, Ontario, Canada

[8] Southern Cross University, Lismore, Australia

[9] University of Technology Sydney, Ultimo, Australia

[10] Pacific College of Health and Science, San Diego, USA

**Background:** Anxiety disorders are prevalent and disabling conditions involving excessive worry and tension. Generalized anxiety disorder (GAD), the most common anxiety disorder, affects 5% of individuals from high-income countries and many individuals report that treatment options are not accessible, effective, or tolerable. Clinical evidence suggests that nutrition interventions, based on the Mediterranean diet and supplementation of omega-3 fatty acids, can significantly improve symptoms of depression; however, the effect of nutrition interventions on anxiety symptoms has not been studied in a clinical population. The primary objective of the present study is to assess the feasibility and acceptability of a dietary counselling and omega-3 fatty acid supplementation intervention delivered to adult women with GAD. The secondary objectives include assessing changes in anxiety symptom severity, assessing changes in quality of life, assessing changes in biomarkers and evaluation of the components of the program.

**Methods:** This study is a randomized, wait-list controlled pilot trial delivering a 12-week, dietary counseling intervention and omega-3 supplementation to 50 adult women with GAD. Participant will complete seven individual counselling sessions which include education, personalized recommendations, mindful eating techniques, motivational interviewing, and goal setting. They will be provided with recipes, instructional videos, and food items. The intervention is designed based on the Social Cognitive Theory and previous research that has been done by the author team to identify dietary constituents with the most evidence to support their use in the treatment of anxiety disorders. Questionnaires and blood work will be completed at baseline, after the wait period (for those in the waitlist group) and after the intervention.

**Results:** Recruitment is ongoing; 260 individuals have expressed interest and 25 have enrolled.

**Discussion:** Results from this study will lay the foundation for future large-scale studies in this area and may provide preliminary evidence of the role of diet counselling and omega-3 supplementation in the management of GAD. Research on the role of nutrition in psychiatric care has been identified as a priority by a number of international organizations. The present trial directly addresses the call for the research that is most needed. This protocol was registered at Clinicaltrials.gov on October 7, 2022; NCT05573672.

**Funding Sources:** This study received funding or gifts in kind from Ekhagastiftelsen, AquaOmega, Mitacs Accelerate, Lipid Analytical Laboratories and Sobeys Inc. Trial funders had no role in the design of the study. A research team member from Lipid Analytical will complete the omega-3 analysis for blinded samples and assist with interpretation of blinded data. The other funders will have no role in the interpretation of finding. The funders will have no role in writing the manuscript.

**Conflict of Interest:** The authors report no conflicts of interest.

### **Investigating exercise, infant massage, and cognitive behavioural therapy for depressive symptoms in postpartum depression: A narrative review**

Lindsey Lohnes, CCNM Student [1], Adam Gratton, MSc, ND [1]

[1] Canadian College of Naturopathic Medicine, Toronto, Ontario, Canada

**Background:** Postpartum depression (PPD) affects 1 in 7 mothers within 3 months of delivery and can affect the mother's ability to cope with life events and newborn development and attachment. Nonpharmacologic interventions are often desired given concerns about breastfeeding during the postpartum period. The evidence and effectiveness of three lifestyle interventions will be summarized in this review: exercise, infant massage, and cognitive behavioural therapy (CBT).

**Methods:** PICO criteria were defined prior to conducting the literature search. Using PubMed and Google Scholar, parameters were set to include studies with 1) women with postpartum depression, 2) intervention of exercise, infant massage, or CBT, 3) comparison control or standard/usual care, and 4) outcome assessment of the Edinburgh Postnatal Depression Scale (EPDS). The search results were limited to randomized control trials and systematic reviews with meta-analyses. Only RCTs not summarized in the meta-analyses were considered for this review.

**Results:** The literature search for infant massage yielded 256 studies, of which 3 RCTs met the criteria. Exercise yielded 44 studies of which 2 RCTs and 1 systematic review with meta-analysis met the criteria. CBT yielded 46 studies, where 3 RCTs and 1 systematic review with meta-analysis met the inclusion criteria. Duration, form, education and intensity of programs offered varied within individual interventions. The 11 studies showed mixed results, 7 studies had clinically significant results.

**Conclusions:** The evidence weakly supports the use of infant massage, and moderately supports the use of exercise and CBT in the treatment of PPD. Significant heterogeneity exists with intervention definition and delivery and further research is needed to quantify the magnitude of benefit. Despite the limited findings, all interventions are low risk, can be relatively low cost, and can be implemented in a variety of settings.

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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.

RL: 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.

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.

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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