

The 10th 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 10th 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; mentors

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Conference Abstracts

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Naturopathic Approaches and Training for Utilizing Research Evidence Informed Practice Skills (NATURES): A Mixed Methods Study

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Introduction: Evidence-based practice (EBP) combines the best available evidence with clinician expertise and patient preference to improve patient outcomes. While a continuing education EBP course for Canadian Naturopathic Doctors (NDs) recently demonstrated high feasibility, acceptability and measurable gains in EBP knowledge and skill, much less is known about the readiness and training needs of American NDs. Understanding these views is critical to designing effective educational initiatives that support the integration of EBP into naturopathic practice in the American context.

Methods: This mixed methods study surveyed American NDs before and after a continuing education EBP workshop. Participants were asked about education topics of interest. EBP skills, attitudes, and use were assessed using the validated Evidence-Based Practice Attitudes and Utilization Survey before and after participation in the workshop. Participants also reported on barriers and facilitators prior to the workshop. Satisfaction with the workshop and workshop performance were assessed after delivery.

Results: The pre-workshop survey was completed by 47 individuals. Education topics of interest included application of EBP to naturopathic medicine, critical appraisal, and identifying sources of bias. Participants reported a moderate to high use of clinical evidence in their practice as well as average to somewhat advanced skills in EBP. They reported an accurate understanding of EBP. Predominantly favorable views towards EBP were reported. Attendees at the workshop reported that it was relevant, effective, and impactful.

Conclusion: These findings suggest that further EBP educational opportunities for American NDs are warranted in order to support further EBP uptake in NDs with the expectation of improving quality of care.

Funding Sources: No funding was obtained for the conduct of this review.

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

The Effect of Myo-Inositol supplementation in Reducing the Risk of Developing Gestational Diabetes Mellitus (GDM) in Overweight and Obese Woman: A Narrative Review

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Background: GDM can have significant effects on women, including an increased risk of preeclampsia and type 2 diabetes. There is some evidence that myo-inositol supplementation (2–4 g/day initiated in the first trimester) may decrease GDM risk and improve outcomes. However, few studies have specifically examined its effects on maternal insulin resistance (mIR), a key underlying mechanism in GDM development. This narrative review aimed to evaluate the consistency of existing findings the use of myo-inositol for GDM prevention in overweight and obese women.

Methods: Articles were selected from PubMed using these inclusion criteria: Randomized controlled trials (RCTs) in overweight and obese pregnant women (BMI >24 kg/m²), myo-inositol supplementation during early to mid-pregnancy (before 28 weeks' gestation) compared to control (folic acid or placebo); primary outcome as the development of GDM on a 75g OGTT at 24–28 weeks of pregnancy, secondary outcomes included as the development of gestational hypertension and newborn birth weight.

Results: Ten RCTs met inclusion criteria. Myo-inositol doses ranged from 2 to 4 g/day, started between 10- and 16-weeks and continued until 24–28 weeks' gestation or delivery. Seven (70%) studies reported a statistically significant lower incidence of GDM in the intervention group (p<0.05), while two found no significant difference. Four (40%) studies reported improvements in mIR or glycemic parameters. One study reported adverse effects (vomiting). Half of the studies reported no

statistically significant differences in major maternal and newborn outcomes including hypertension and birth weight compared to control.

Conclusion: Most studies reported a statistically significant reduction in GDM incidence with myo-inositol supplementation. Improvements in mIR support a role in the insulin signaling pathway, although findings were not consistent across all trials. The use of myo-inositol supplementation is a promising treatment option to prevent GDM in overweight and obese women.

Funding Sources: No funding was obtained for the conduct of this review.

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Investigating the Effect of Photobiomodulation (PBM) on Fertility Outcomes: A Narrative Review

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Background: Infertility affects approximately one in six couples in Canada. Reproductive health challenges often stem from issues related to impaired gamete quality and cellular function. Photobiomodulation (PBM), a non-invasive light therapy, could be relevant to reproductive health based on evidence that it may enhance cellular metabolism and nitric oxide levels, which may be important for maintaining optimal reproductive cell function and supporting sperm motility. The purpose of this review was to examine existing literature on the effects of PBM on fertility outcomes in males and females.

Methods: PubMed and The Cochrane Library were used to search for available literature with the following inclusion criteria: 1) Humans; 2) PBM in any form; 3) Control group without treatment (control or untreated); 4) Analysis of markers for fertility (e.g., sperm motility, successful pregnancy) as an outcome; 5) Experimental studies; 6) Peer-reviewed article; 7) English language. The search string (photobiomodulation OR PBM OR PBMT) AND (fertility OR infertility OR sperm count OR sperm motility) was used, and filters were used for English language and human studies. References of articles from the search were analyzed for potential additional articles.

Results: The search yielded 41 studies, of which 12 studies met the inclusion criteria. An additional three studies were identified from the reference list analysis of included articles. Studies conducted in males showed positive effects in sperm motility and function, improved regulation of mitochondrial energetics, and nitric oxide levels. In females, an increased rate of successful pregnancies and positive fertility tests were demonstrated.

Conclusion: PBM therapy demonstrated favorable reproductive outcomes in the available studies. Given that the majority of the included experimental studies focused on males and lacked long-term reproductive outcomes, further randomized trials are needed to strengthen these prospective insights and potentially assist in addressing fertility challenges in both males and females.

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Building the Comprehensive Research Evidence Synthesis Training (CREST) Center: A Process Evaluation of a Virtual Systematic Review Training Center for Complementary and Integrative Healthcare Trainees

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Introduction: Systematic reviews are the foundation of evidence-based guidelines, yet most systematic reviews in the field of complementary and integrative health (CIH) are of critically low quality. The Comprehensive Research Evidence Synthesis Training (CREST) Center was developed as a virtual, mentorship-driven training center that explicitly includes CIH institutions and learners. This abstract reports on a process evaluation of CREST's first two years, highlighting its design, participant characteristics and outputs.

Methods: We employed a mixed-methods process evaluation of CREST from 2023–2025. Data sources included program records, administrative documents, mentee and mentor interviews, participant surveys, and outputs from systematic review

projects. Process metrics included retention, systematic review progress, and peer-reviewed publications. Review quality was assessed using the AMSTAR-2 tool.

Results: Thirty-five trainees enrolled from diverse institutions, including naturopathic medical schools, graduate nutrition programs, and medical schools. Most participants were students from CIH institution or early-stage clinician-researchers with limited prior access to high-level systematic review training. Retention was high, with only two attritions (6%). Educational activities included biweekly Evidence Synthesis Lab meetings, asynchronous training modules, and mentorship. Within two years, CREST registered 16 systematic reviews, published two protocols, and two full reviews, both rated “high quality” on AMSTAR-2. Analysis of the qualitative data from participant surveys and quantitative data from interviews are underway.

Conclusion: CREST demonstrates that a virtual, structured, mentorship-driven program can train CIH healthcare trainees, producing tangible, high-quality outputs in evidence synthesis. Early results suggest that CREST is both feasible and replicable. Outputs already exceed expectations.

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

The Role of Nutrition in Mental Health Care in North America: A Qualitative Study

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Introduction: The emerging field of ‘nutritional psychiatry’ explores the interplay between nutrition and mental health. In observational and clinical trials, high-quality, nutrient-rich diets are associated with decreased risks of depression and anxiety, while ultra-processed diets are linked to an increased risk of mental health disorders. Despite this growing evidence, implementation of dietary counselling in mental health care is limited. This qualitative study aims to explore mental health practitioners’ experiences, perceptions, and barriers in discussing nutrition in clinical care within the North American contexts to identify gaps in education and inform future practices.

Methods: This project involved the conduct of focus groups with Canadian or American mental health practitioners. Participants were recruited via social media platforms, email listservs, and word of mouth by the research team. The focus groups were 60–90 minutes in length and conducted virtually. A semi-structured interview methodology was used. Analysis is currently underway using Kuckartz content analysis method.

Results: Twenty-four mental health practitioners from Canada or the United States attended a focus group. Practitioner qualifications included social workers, psychologists, psychiatrists, counsellors, and psychotherapists. Five overarching themes were identified: 1) Practitioners’ Knowledge, Awareness and Confidence, 2) Practitioners’ Experiences of Discussing Nutrition with Clients, 3) Drivers and Barriers to Implementation, 4) Skepticism and Critical Perspectives, 5) Future Directions and Perceived Impact. Additional analysis is in progress.

Conclusion: Mental health care practitioners report a high level of interest in the role of nutrition in mental health care. They recognize it as an important component of care but also acknowledge the presence of barriers and the need for additional training and support.

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

Quercetin for the Treatment of Dermatographic Urticaria with Angioedema: A Case Report

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Introduction: Dermatographia urticaria is an allergic skin condition marked by itching and raised red marks that appear after scratching. It can occur in combination with angioedema, characterized by swelling beneath the skin. These conditions are

common and result in significant discomfort. Not all patients respond to the available treatment options. Quercetin is a flavonoid with anti-allergic and anti-inflammatory effects.

Case presentation: A 30-year-old female patient presented with symptoms of dermatographia urticaria that were persistent and impacted her quality of life. The patient was prescribed oral quercetin (1000mg) and vitamin C (2000mg), once per day. By the six-week follow-up, the patient reported resolution of the urticaria and angioedema symptoms. During a two-week period where she discontinued her supplements prior to an appointment with an allergy specialist, she experienced a return of angioedema symptoms. Reintroduction of the supplements was followed by resolution of the symptoms.

Conclusion: While studies have previously reported a decrease in certain allergic symptoms following supplementation with quercetin, no clinical trials have assessed the effects on dermatographic urticaria or angioedema. The outcome of this case suggests that research is needed to understand the impact of this intervention on these common conditions.

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The Effect of *Rosmarinus officinalis* on Depression, Anxiety and Psychological Stress in Adults: A Systematic Review and Meta-Analysis

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Introduction: One in eight people live with a mental health condition, most commonly depression or anxiety. *Rosmarinus officinalis* (rosemary) is a medicinal plant. Several constituents of rosemary are known to act on the nervous system by modulating monoamine neurotransmission and by reducing sympathetic overactivation. The aim of this systematic review and meta-analysis is to synthesize the evidence on the effect of rosemary for the treatment of depression, anxiety, and psychological stress.

Methods: Eligible studies were randomized controlled trials that included adult populations and administered rosemary. Medical databases searched included MEDLINE (PubMed), Embase (Ovid), Web of Science (Core Collection), and CINAHL. Meta-analysis was completed to calculate the pooled standardized mean difference (SMD) with corresponding 95% confidence intervals (CI). Risk of bias was assessed using ROB2.

Results: The literature search yielded 1564 studies after deduplication. Fourteen studies met criteria for inclusion, including a total of 865 participants. Nine of the 14 studies administered rosemary by inhalation, mostly in a single dose, while five studies administered it orally for four to eight weeks. Meta-analysis did not reveal a significant benefit to depression, anxiety, or stress outcomes. Heterogeneity was high. Risk of bias was “high” or “some concerns” in five and six studies, respectively. In a planned sub-analysis, the studies using oral rosemary significantly improved anxiety symptoms (SMD= -0.61; 95% CI: -0.99, -0.23). Post hoc sub-analysis found a significant improvement in anxiety symptoms among the studies that provided treatment for four to eight weeks.

Conclusion: It is uncertain if rosemary supplementation improves anxiety, depression, and psychological stress outcomes. More research on the impact of oral rosemary supplementation for four to eight weeks is warranted.

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Dietary Glycemic Index/load, Insulin Index/load and Anxiety: A Systematic Review and Meta-analysis

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Introduction: Anxiety disorders are the most prevalent psychiatric conditions worldwide, yet many affected individuals report that the available treatment options are not fully accessible, tolerable or effective. There is a need for novel treatment options. Diet has been increasingly recognized as a key determinant of mental health conditions, and the post-prandial glycemic effects of foods may alter biological pathways linked to anxiety. This study aims to systematically review and analyze existing evidence on the relationship between dietary glycemic index/load and/or dietary insulin index/load and anxiety outcomes.

Methods: A systematic review and meta-analysis will be conducted to evaluate the association between dietary glycemic measures: glycemic index, glycemic load, dietary insulin index, and dietary insulin load, and anxiety outcomes. Eligible studies are experimental or observational studies including participants aged 18 years or older with clinically diagnosed or self-reported anxiety disorder or symptoms. A search was conducted using PubMed, Embase, Web of Science, and CINAHL using controlled vocabulary and free-text terms. Duplicate, independent screening is complete, and data extraction is in progress. Standardized risk of bias assessments, and meta-analysis will be performed where data permits.

Results: The search identified 9181 studies after deduplication. After title and abstract screening, 43 studies were included. After full text screening, 12 studies have met criteria for inclusion: 3 experimental studies and 9 observational studies. Data extraction is in progress.

Conclusion: Understanding how dietary glycemic index and load may influence anxiety could provide new insight into the plausible role of diet patterns and blood sugar regulation on anxiety symptoms.

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The Effect of Dietary Protein on Anxiety and Stress Symptoms: A Scoping Review

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Introduction: Anxiety and psychological stress are increasingly prevalent, with dietary factors emerging as potential modifiable risk factors. Protein intake may have an impact on mental health by modulating neurochemical pathways and the microbiota-gut-brain axis. Despite growing interest, there has been no systematic investigation of dietary protein's role in anxiety and stress disorders. This scoping review aims to examine and map the existing evidence on the relationship between dietary protein quantity or quality and anxiety or psychological stress symptoms or disorders in human and animal studies

Methods: Data was sourced from Medline (PubMed), EMBASE, Web of Science, and CINAHL. A comprehensive search strategy included keywords and subject headings related to anxiety, stress, and dietary protein, with no restrictions on language or publication date. Screening was completed independently and in duplicate. Data will be synthesized qualitatively to identify key trends and gaps in the literature.

Results: The search yielded 20,270 results after deduplication. 368 studies were eligible for inclusion after title and abstract screening and 311 were eligible after full text screening. Data extraction is complete and analysis is in progress. Several categories of studies have been identified including studies on dietary protein intake (experimental and observational), amino acid intake (experimental and observational), studies that provided a protein-rich food intervention, and studies reporting on alteration of tryptophan intake or levels.

Conclusion: This scoping review will map the breadth of evidence on dietary protein's role in anxiety and psychological stress, identify key knowledge gaps, and inform future research direction.

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

A Case Report on Self-Directed Recovery of Gu Syndrome: Reversal of Multisystem Dysfunction via Microbiome Restoration and Subconscious-Guided Protocols

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Introduction: Gu syndrome in Traditional Chinese Medicine (TCM) is a chronic inflammatory condition caused by pathogens, toxins, and parasites, characterized by digestive and neurological symptoms. In this case, this condition involved significant microbiome disruption, presenting as *Candida* overgrowth, dysbiotic flora consistent with small intestinal bacterial overgrowth (SIBO), mold toxicity, intestinal hyperpermeability, and chronic multisystem involvement.

Case presentation: A 38-year-old male developed multiple symptoms after a trip to a developing country. The patient tested positive for *Candida albicans* and dysbiotic flora consistent with SIBO on a stool analysis, leaky gut on an intestinal antigenic permeability test, and mold toxicity on a visual contrast sensitivity test. The patient was subsequently diagnosed with Gu syndrome based on clinical presentation. Management included dietary protocols for *Candida*, SIBO, mold, gut lining repair, and bacterial regrowth, along with targeted supplementation. His clinical symptoms and physical and metabolic performance markers improved significantly through a phased terrain-based recovery protocol and minimal pharmaceutical intervention. The patient presented with both digestive and neurological symptoms not explained by conventional medicine or typical TCM patterns. Dr. Heiner Fruehauf's diagnostic criteria for Gu syndrome involve both digestive and neurological symptoms that are unexplained by medical systems, which the patient met. The subconscious-driven approach was based on the patient's intuition about overall health and the progression of symptoms, which guided management. The patient restored balance in his system or terrain, as confirmed by the lab results. However, a patient-driven, subconscious approach may lead to inconsistent supplement dosing and improper testing.

Conclusion: The results are only generalizable with further research evaluating subconscious-driven decision models and microbiome-centred protocols for complex, chronic inflammatory conditions considered persistent or idiopathic.

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A Case Report on Polyarthralgia with Rash Following Parvovirus Manifesting as a Sequela of Streptococcal Infection

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Introduction: Polyarthralgia and arthritis linked to Parvovirus are more common in adults (50-80%) than in children (8%). Arthritis symptoms generally start within 5-10 days of a prodromal illness and can last from a few days to several months.

This case report demonstrates that Parvovirus can cause polyarthralgia and polyarthritis in adults, which may resemble the sequelae of Group A streptococcal infection, such as acute rheumatic fever (ARF) or acute post-streptococcal reactive arthritis.

Case presentation: A 36-year-old Caucasian female presented to the clinic with polyarthralgia starting 4 days prior, with rash onset about a week before polyarthralgia. She had 3 courses of antibiotics for Group A Streptococcal infection consecutively within the last 5 months; the last course ended roughly 6 weeks before her current symptoms started. Laboratory investigations showed positive IgM and IgG Parvovirus B19 antibodies and were negative for other inflammatory markers. The patient was exposed to a parvovirus outbreak at a preschool where she worked as a teaching assistant. She was initiated on a supplement containing bromelain, curcumin, quercetin, omega-3, and vitamin D3 to decrease inflammation and regulate the immune response. The sudden onset of the patient's symptoms, followed by quick symptom resolution, supports the diagnosis of viral arthritis. Additionally, the timeline of her symptoms did not align with the typical window period for ARF and post-streptococcal reactive arthritis, thereby excluding these exanthems. ARF mainly affects children, usually within 2-4 weeks of a Group A streptococcal infection, with symptoms resolving in 1-3 weeks, whereas post-streptococcal reactive arthritis occurs more suddenly, has a bimodal age distribution, and can last up to two months.

Conclusion: Acute clinical awareness and laboratory testing are required to distinguish viral from bacterial causes of arthritis. This will facilitate correct clinical diagnosis and formulation of a management plan.

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Combined Use of Berberine and Probiotics for Glycemic Management in Type 2 Diabetes Mellitus: A Narrative Review

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Introduction: Type 2 diabetes mellitus (T2DM) remains a major global health challenge, with rising prevalence and significant residual risk despite standard therapies. Natural health products offer additional therapeutic avenues in the management of T2DM. The two interventions with promising mechanistic and clinical evidence are berberine (BBR) and probiotic supplementation. The objective of this review is to synthesize available evidence on the combination of berberine and probiotics in the management of glycemic markers in T2DM, assessing potential synergy and identifying research gaps.

Methods: The inclusion criteria included human randomized controlled trials (RCTs), and systematic reviews with meta-analyses investigating the combination of BBR and probiotics in individuals with hyperglycemia, when compared to the use of either agent alone or placebo. Primary outcome measures will evaluate changes in either HbA1c, fasting glucose, post-prandial glucose or HOMA-IR. Secondary outcome measures will include gut microbiota changes. PubMed, Cochrane, CINAHL, and Medline will be used for the research.

Results: The search identified 24 studies; 2 RCTs met the inclusion criteria. One RCT showed that BBR, with or without probiotics, significantly reduced HbA1c, fasting and post-load glucose, triglycerides, total cholesterol, and LDL-C while probiotics alone showed no glycemic benefit. The improvements in insulin resistance were observed only when probiotics were combined with BBR. The other RCT showed that probiotics alone did not significantly alter microbial composition, whereas BBR induced marked shifts, including depletion of short-chain fatty acid-producing taxa and enrichment of *Bacteroides* spp. and γ -Proteobacteria. The combination therapy probably produces glycemic improvements similar to BBR alone through complementary effects on metabolism and gut microbiota. The addition of probiotics may offer additional benefits by modulating gut microbiota, which could support long-term metabolic health and patient-specific responses. However, the current evidence is limited by study heterogeneity and the short duration of studies.

Conclusion: The preliminary findings suggest there is insufficient evidence to assess the impact of the combination of BBR and probiotics. Future studies are indicated to further assess the impact of the combination.

Funding Sources: No funding was obtained for this review.

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

Developing Clinical Practice Guidelines for Natural Products in Oncology: Results from a Database Coverage Analysis

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Background: The foundation of clinical practice guidelines (CPGs) is a systematic literature search. Searching for natural health product (NHP) research poses challenges, including the diversity of products, varied terminology, and inconsistent indexing. The Cochrane Handbook recommends searching at minimum Medical Literature On-Line (MEDLINE), Embase, and Cochrane Central Register of Controlled Trials (CENTRAL); however, it is unclear if this is optimal for NHP guideline development. Beyond traditional bibliographic databases, the Knowledge in Integrative Oncology Website (KNOW) is a curated repository of natural agents in cancer compiled from MEDLINE and Embase. In this project, we evaluated: (1) which bibliographic databases are necessary for comprehensive coverage, (2) the added value of KNOW, and (3) the potential of KNOW to replace systematic database searches.

Methods: A systematic search strategy of NHPs for chemotherapy-induced peripheral neuropathy was developed with a medical librarian for MEDLINE, Embase, Allied and Complementary Medicine Database (AMED), Cochrane Library, and Cumulative Index to Nursing and Allied Health Literature (CINAHL) (“Patterson” search). KNOW was searched using the neuropathy side effect tag and neuropathy-related keywords. All databases were searched from inception to March 2025. Articles were screened by two independent reviewers based on the guideline’s eligibility criteria. Database coverage was assessed by calculating the proportion of included studies retrieved from each database.

Results: After de-duplication and screening, 91 unique relevant articles were identified. KNOW retrieved the greatest percentage of relevant articles (82%) followed by Embase (71%), MEDLINE (59%), CINAHL (36%), Cochrane (35%), and AMED (2%). The full Patterson search retrieved 81 articles (89%), with KNOW retrieving 10 articles not found in the Patterson search. A combination of KNOW, Embase, and MEDLINE retrieved 90 relevant articles (99%). CINAHL retrieved the remaining article; AMED and Cochrane did not find any unique articles compared to KNOW, MEDLINE, and Embase.

Conclusion: This analysis highlights the importance of searching multiple databases despite overlapping coverage. The KNOW database alone is insufficient to replace traditional literature searches; however, it adds value in conjunction with MEDLINE and Embase for systematic searches for NHPs in cancer care. AMED, CINAHL, and Cochrane Library offered minimal value, contributing only one unique citation collectively.

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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.

PC, JP, FS, MB, MA, 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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