

Masters of Nutrition and Dietetics **Research Colloquium Day**

Thursday, April 4th, 2024

12:30 - 3:00 pm

Location:

Michael Smith Laboratories Room 101

Vancouver Campus

2185 East Mall

Vancouver, BC Canada V6T 1Z4

Agenda

12:30 - 1:00	Welcome guest on campus
1:00 - 1:15	Opening Remark
1:15 - 1:35	Presentation 1: Examining nutrition adequacy of pediatric formula used in Critically Ill child
1:35 - 1:55	Presentation 2: Virtual Cooking Classes for Families of Children living with CKD
1:55 - 2:15	Presentation 3: Comparison of indirect calorimetry to predictive equations in ICU
2:15 - 2:25	Break
2:25 - 2:45	Presentation 4: Palliative radiation therapy, nutrition symptoms and health equity
2:45 - 3:05	Presentation 5: Household Food Insecurity and related factors among people experiencing Homelessness
3:05 - 3:15	Closing Remark

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Nutrition adequacy compared to guidelines in PICU setting at BC Children's Hospital

Tanvir Jassal MND (c) and Jennifer Ying MND (c)

Supervised by: Kaitlin Berris RD, BSc PhD (s) and Dr. Rajavel Elango PhD

Location: BC Children's Hospital

Rationale. In the pediatric intensive care unit (PICU), enteral nutrition (EN) is essential to a critically ill child. Inadequate nutrition is associated with adverse clinical outcomes and higher rates of mortality. The aims of this study were to compare BC Children's Hospital (BCCH) enteral feeding practices (initiation of feeding, EN prescriptions and interruptions) to clinical practice guidelines.

Methods. This study involved a retrospective chart review (February 26th, 2022, to March 31, 2023.) We included patients ages of 1-6 years who had a PICU encounter of at least 72 hours, were receiving exclusive EN for a minimum of 3 days. Patient, admission, and feeding characteristics of patients were collected for the first 7 days since admission. The primary outcome was nutritional adequacy, defined as having a mean value of energy intake above 66% during patient's length of stay (excluding the day of admission and day of discharge). Other outcomes were dietitian assessments within 48 hours, EN initiation within 48 hours, concentrated formulas ordered for fluid-restricted patients, and interruptions of EN. Descriptive statistics and Fisher's exact tests were performed to explore factors contributing to inadequacy.

Results. This study included n=22 patients (68% male, mean length of stay was 9.2 days). Respiratory conditions requiring ventilation were the main reason for admission. Majority of patients (54%) did not meet their required energy needs during their stay. The mean number of interruptions per day was 2 with a mean duration of 5 hours/day. There was an association between interruption duration of 5 hours and adequacy ($p = 0.004$). The most common reason for interruptions of EN was due to procedures (29.4%). Majority (86%) received EN within 48 hours of admission however, 54% received EN prior to PICU admission. Thirteen percent of patients had a dietitian assessment within 48 hours and only 50% of fluid-restricted patients were on a concentrated formula. There was no association between dietitian assessment or fluid restriction and adequacy ($p = 1.0$).

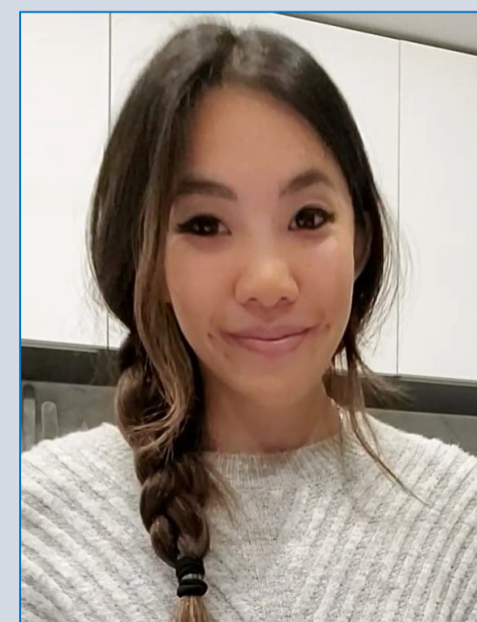
Conclusion. Our findings suggest nutritional inadequacy to be present in the PICU at BCCH. These results can inform future quality improvement initiatives and provide a framework for other settings to investigate nutritional inadequacy prevalence.

Funding. None.



Tanvir (*left*) received her BAsC in Applied Human Nutrition from the University of Guelph in 2021. She found data collection to be challenging but rewarding part of the research process. She hopes to continue doing research in the field of dietetics to advance clinical practice.

Jennifer (*right*) received her BSc in Business Administration from Fordham University in 2009. Her favorite aspect of the research process was strengthening her critical thinking skills and learning how to pivot at every stage, from forming a research question to statistical analysis. After graduating, she hopes to pursue her interests in reproductive health and nutrition.



Virtual Cooking Classes Impact Food Skills in Caregivers of Children with Chronic Kidney Disease

Alicia Walch, Kiana Gibson, Meredith Cushing RD, MSc, MSHSE

Research Location: BC Women's and Children's Hospital, UBC (Vancouver)

Purpose. Children with Chronic Kidney Disease (CKD) require strict dietary control of sodium, potassium, and phosphorus to delay complications like dialysis. However, these nutrients are prevalent in processed foods, making at-home cooking a critical strategy for nutritional management of CKD. However, cooking at home requires significant time, planning, and knowledge to accommodate a CKD-appropriate diet. So, virtual cooking classes could be a practical approach for caregiver education. The goal of this study was to investigate the impact of three virtual cooking classes on food skills among caregivers of children with CKD.

Methods. This study had a pre-post design using a validated tool called the Food Skills Questionnaire (FSQ). Caregivers were recruited from the Chronic Kidney Care Clinic at British Columbia's Children's Hospital (n=17, all female). The intervention consisted of 3 virtual cook-along classes that demonstrated kidney-friendly, kid-friendly, and budget-friendly recipes, held 2-3 weeks apart from October to December 2023. Caregivers had to participate in at least one of three cooking sessions, either cooking along, watching live, or watching a recording. Food skills were assessed using the FSQ before and after the cooking classes in three domains: 1) food selection and planning, 2) food preparation, and 3) food safety and storage. The FSQ produces a total score out of 100 for each domain. Pre-post FSQ scores were analyzed by Student t-tests.

Results. There was a statistically significant increase in the score for domain 3) food safety and storage (mean difference [MD] in score +4.24, $p = 0.02$). Although not statistically significant, there was also an increase in scores for domains 1) food selection and planning (MD +6.34, $p = 0.07$), 2) food preparation (MD +1.92, $p = 0.35$), and total score (MD +3.54, $p = 0.08$).

Conclusion. This study showed that virtual cooking classes significantly improved domain 3) food safety and storage skills of caregivers who have a child with CKD. Virtual cooking classes have the potential to be an accessible, practical, and affordable approach to the nutritional management of pediatric CKD, however future studies are needed to confirm these results.

Funding provided by: Chronic Kidney Care Clinic, BC Women's and Children's Hospital

Kitchen space provided by: Faculty of Land and Food Systems, University of British Columbia



Left to right: Meredith Cushing, Alicia Walch & Kiana Gibson during a virtual cooking class (October 2023).

About Alicia:

1. Bachelor of Science in Physical Geography, University of Calgary, 2018.
2. I enjoyed learning about the intricacies of CKD management from our preceptor, Meredith Cushing, and participating in the Western Medical Research Conference, where we showcased our research.
3. I hope to work as a dietitian specializing in managing autoimmune disorders and/or optimizing gut health.

About Kiana:

1. Bachelor of Arts & Science in Nutrition and International Development, University of Guelph, 2022.
2. I enjoyed the coordination, practice, and creativity required to host virtual cooking demos – and the value it provides patients!
3. I hope to work both in sports nutrition and abroad with the World Health Organization.

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A retrospective chart review to evaluate the levels of agreement between resting energy expenditure measured by metabolic cart to those based on the 2022 ASPEN Guidelines in mechanically ventilated adult patients in the ICU

Jessica Flechner-Klein (MND Student), Kiara Gaspari (MND Student), & Courtney Wedemire (MS, RD, Preceptor)

Research Location: Abbotsford Regional Hospital (ARH), Abbotsford, British Columbia

Purpose: Limited access to indirect calorimetry in ICUs may compromise patient recovery for practitioners adhering to ASPEN's revised 2022 guidelines, which offer weak recommendations and pose challenges for clinicians relying on clinical judgment. To our knowledge, no previous studies have addressed this gap. The purpose of this study was to compare resting energy expenditures (REE) predicted using the 2022 American Society for Parenteral and Enteral Nutrition (ASPEN) Guidelines to REE measured using indirect calorimetry (IC) in mechanically ventilated adult patients admitted to the intensive care unit.

Methods: We conducted a retrospective chart review of n=58 mechanically ventilated patients who had REE measured by a metabolic cart (QNRG+, Baxter) who were being treated at Abbotsford Regional Hospital (British Columbia). Demographic (sex, age, body mass index (BMI)) and REE data were retrieved from patient charts and analyzed using descriptive statistics (mean \pm standard deviation or median [interquartile range]). A sub-analysis of n=22 charts with available BMI were also analyzed and stratified by BMI $<$ or $>$ 30 kg/m². Mann-Whitney U Tests were used to compare the differences between measured REE (mREE) by IC to predicted REE (pREE) at the lower (12 kcal/kg) and upper (25 kcal/kg) ASPEN Guidelines. Bland-Altman analyses were used to assess the levels of agreement between mREE and pREE. Clinically acceptable accuracy was set a priori as \pm 10% agreement.

Results: Participants were 63.8% male with a median age of 64 [16.7] years and had a mean mREE of 1615 \pm 470 kcal/d. pREE calculated using lower (970 \pm 284 kcal/d) and upper (2021 \pm 592 kcal/d) guidelines were significantly different compared to mREE (p<0.001). Both the lower and upper guidelines showed poor agreement with mREE, predicting REE within \pm 10% agreement in 0% and 22.4% of patients, respectively. When stratified by BMI (in n=22, the average BMI was 35.8 \pm 5.6 kg/m²), poor levels of agreement between pREE and mREE were seen (with biases of 648 \pm 458 kcal/d (lower) and -688 \pm 463 kcal/d (upper)), with the ASPEN guidelines again failing to predict REE within clinically accepted accuracy.

Conclusion: Predictions of REE using the 2022 ASPEN guidelines showed poor agreement with measurements obtained by IC and in patients living with a BMI $>$ 30kg/m². The upper guideline (25 kcal/d) had slightly stronger agreement, but still considerably overestimated REE and had weak clinical accuracy. This study supports the use of IC as the preferred method for determining REE for mechanically ventilated patients in the ICU.



Jessica Flechner-Klein: I completed my Bachelor of Science degree in General Science at the University of British Columbia Okanagan (UBCO) in 2020. A major highlight was witnessing my preceptor, Courtney, investigate novel techniques like using ultrasound for anthropometric assessments. These experiences have motivated me to carry forward this work in my future career as a dietitian, contributing to the ongoing advancement of the field.

Kiara Gaspari: I completed my Bachelor of Science degree in Psychology at UBCO in 2021. The development of my clinical research skills was an enriching experience made possible by Courtney's extensive knowledge and mentorship. Once I become a registered dietitian, I hope to merge my newfound enthusiasm for research with my interests in weight management and eating disorders.



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Malnutrition Risk Among People Receiving Palliative Radiation Therapy at BC Cancer: A Time Series and Geographical Analysis

Presenters: Shelby Cender & Simran Sappal

Preceptors: Lindsay Van der Meer, RD, MHS & Eleah Stringer, RD, MSc, CSO

Research Location: BC Cancer

Introduction. Malnutrition is common among people living with cancer which can contribute to reduced treatment response and survival. Routine malnutrition screening can identify at-risk patients. However, the impact of geographical distance to a treatment center on malnutrition risk is not well understood. The aim of this study was to characterize and analyze malnutrition risk in relation to a patient's distance from the nearest BC Cancer treatment center among patients receiving palliative radiation (PRT) therapy.

Methods. The study is a retrospective chart review that utilized data from BC Cancer's Early symptom Indicators for Cancer Care (EPICC) Screening Program. A Nutrition Screening Tool (NST) based on scores ranging from 0-5, where scores of 0-1, 2-3, and 4-5 indicated low, moderate and high malnutrition risk, respectively. Descriptive statistics were used to characterize malnutrition risk based on EPICC data. Patient addresses and Google Maps were used to analyze the distance between patients' primary residence to the nearest BC Cancer center. A Kruskal-Wallis test was conducted to compare differences in total malnutrition score by regional location of EPICC participants.

Results. Thirty-two percent of all NST scores (n=798) collected through EPICC received a moderate malnutrition risk score and 7.2% received a high malnutrition risk score. Among 400 patients, those living closest (< 5.08 km) and farthest (> 160 km) from the nearest BC Cancer Center had the highest mean NST score of 2.06 and 2.05, respectively. The greatest difference in NST scores (0.52) were observed between those who lived less than 5 km and those who lived between 5-13.5 km from the center (p=0.068).

Conclusion. People with cancer receiving PRT experience malnutrition risk. However, geographical proximity to cancer centers does not appear to impact how malnutrition risk is experienced. Further research is needed to understand the role of repeat screening and geographical distance between cancer care and malnutrition risk.



Shelby Cender

Shelby Cender previously obtained her BSc from the University of Alberta in Nutrition and Food Sciences in 2015 and returned to school to become a dietitian. Her research project with BC Cancer taught her important research skills such as data analysis that she hopes to bring into her future work. She is intrigued with the gut microbiome and hopes to research or educate on this area in her professional practice.

Simran Sappal received her Bachelor of Science from Simon Fraser University in 2020 with a major in Biology and a focus in Cells, Molecules, and Physiology. She has gained a greater understanding in the importance of malnutrition screening in conjunction with her academic knowledge in nutrition care for cancer treatment. She hopes to eventually work in pediatrics or become a nutrition and dietetics instructor.



Simran Sappal

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Exploring Perceived and Actual Barriers to Food Security Among People with Lived and Living Experiences of Homelessness

Jennifer Appiah¹, Kailee Wark¹, Matthew Brown²

¹University of British Columbia (UBC), Faculty of Land and Food Systems

²Fraser Health Authority - Abbotsford

Background. In Abbotsford (Canada), the rate of food insecurity is significantly pronounced in People with Lived and Living Experiences of Homelessness (peers). While free and low-cost food options (FLCFO) such as food banks exist, peers account for only 2% of the targeted clientele. Prior investigations on the relationship between food insecurity and the experiences of homelessness have been conducted without considering the perspectives of those directly impacted. The purpose of this qualitative study was to describe the perceived barriers to accessing FLCFO by service providers (SPs) and explore the actual barriers experienced by peers to better inform interventions aimed at reducing food insecurity.

Methods. SPs (n=28) from 18 different FLCFO organizations and peers (n=35) who resided in Abbotsford were recruited to participate in a Focus Group Discussion (FGD). Preliminary inductive analyses were conducted to generate a codebook that categorized the barriers to food security as they related to accessibility, availability, agency, utilization, and stigma. Subsequent deductive coding and content analyses were performed using Nvivo. Data were analyzed by relative frequency count of each barrier.

Results. SPs FGDs (n=5 FGD) focused primarily on stigma, food preferences, and contextualized services. Peer FGDs (n=7 FGD) focused primarily on health concerns, security of belongings, and food preferences. A sub-analysis of the most commonly discussed barriers revealed a discrepancy between the foods offered by FLCFO and the foods actually necessitated by peers. Specifically, SPs described constraints to foods offered as being limited based on donations, while peers expressed a need for foods that were nutritionally adequate, safe, and easily prepared and stored.

Conclusion. This study highlights the difference between the barriers to accessing FLCFO as perceived by SPs and the actual barriers experienced by peers, thereby identifying an opportunity for FLCFO to more effectively address the needs of peers. By actively considering the types of foods offered, FLCFO will be better positioned to tailor services to support food security among those most impacted. This study will support the continuation of work that will adapt the Household Food Insecurity Access Scale (HFIAS) to more accurately capture the experiences of peers who reside in Abbotsford.

This work was supported by the Fraser Health Authority Community Food Action Initiative and the Vancouver Foundation Convene Research Grant.



Jennifer Appiah BSc (Hons) Psychology, University of Northern British Columbia, 2015

With this project, I have gained tremendous knowledge about the complexities involved in qualitative analysis. In investigating the depths of the barriers to food insecurity, I am proud and honoured to have played a role in amplifying the voices of peers to effect meaningful and necessary change. After graduation, I hope to utilize nutrition and dietetics to navigate the complexities of chronic diseases and to further promote the health and success of marginalized communities.

Kailee Wark BSc Microbiology and Immunology, Minor in Entrepreneurship, McGill University, 2019

I really appreciate the opportunity to highlight the high degree of food literacy skills expressed by the peer participants: knowing what foods are important for specific health concerns, are nutritious and energizing, and which foods can be stored and prepared in a food safe manner within the living context, are great strengths! With my MND degree, I plan to pursue both clinical and social justice-related work to learn from and support daily lives, and to better sustain our communities into the future.

