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A review of reviews on knowledge brokering as a knowledge translation strategy to support evidence informed decision making of registered dietitians in public health

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Background: Knowledge brokering as a knowledge translation strategy promotes evidence informed decision making through facilitating collaborations between researchers and end users. This review assessed systematic reviews on the effectiveness of the knowledge brokering role as well as explored a possible avenue of applying the knowledge brokering role to registered dietitians working in public health. **Objectives:** Summarized systematic reviews on the impact of knowledge brokers on promoting and improving evidence informed decision-making and qualitatively analyzed opinions, applicability and recommendations for registered dietitians working in public health as knowledge brokers on evidence-informed decision making. **Methods:** Electronic databases were searched for systematic reviews of interventions using knowledge brokers to assess their effectiveness on outcomes related to evidence informed decision making. Articles were screened, assessed for methodological quality and individually analyzed. Registered dietitians were recruited through colleagues, Dietitians of Canada and personal contacts. Interviews were semi-structured with open questions, where hand written notes were supplemented with transcribed notes from audio recordings and analyzed with software. **Results:** Total of 4731 articles were screened where 7 met the inclusion criteria. A few primary articles in the reviews used the term knowledge brokering. The reviews showed promise in knowledge brokering however the effective on evidence informed decision making remains uncertain due to inexplicit outcome measures. Total of 23 registered dietitians across Canada were interviewed. Most registered dietitians were well established and heard the term knowledge brokering before but not necessarily the full definition. All registered dietitians could identify with knowledge brokering in their daily work. Major barriers for knowledge brokering are time, capacity and fully understanding the benefits of knowledge brokering. **Conclusion:** Knowledge brokering as a knowledge translation strategy has shown potential but remains to be seen in effectively increasing evidence informed decision making. Registered dietitians working in public health naturally assume knowledge brokering type activities, therefore, increasing capacity of registered dietitians in public health should be considered.

Lessons learned from SMART nutritional goals used by men and women with prediabetes in a lifestyle intervention program at the STAR Family Health Team

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Objectives: To determine if differences were observed between men and women when using the SMART nutrition goal setting approach. **Methods:** Rural adults, identified with prediabetes were invited to participate in a 6-month intervention program with emphasis on healthy lifestyle. All participants were offered the same education on SMART goals setting and were invited to formulate, on a voluntary basis, a monthly nutrition goal. When formulating a SMART goal, they were asked to qualify, on a scale of 0 to 10, their confidence level as well as the achievement level of the established goal. **Results:** Thirty-nine participants (22 men, 17 women) aged 61.3 ± 7.3 attended an average of 7.7 ± 1.2 out of 9 visits. To date, preliminary results show that 39 high attendees (≥ 4 visits) have set 162 SMART nutritional goals overall. Men have formulated an average of 4.0 ± 1.7 SMART nutrition goals, while the women's average is 4.4 ± 1.8 ($p=NS$). The confidence level in achieving formulated goals was also very similar for men and women (6.9 ± 1.5 vs 6.8 ± 1.9 , $p=NS$). Although, men were trending toward more success at achieving their SMART nutritional goals than women, no significant differences were observed between the average achievement levels they declared (6.7 ± 2.6 vs 5.8 ± 2.9). **Implications and conclusions:** Preliminary results demonstrate that, on average, men and women participated equally in the formulation of SMART nutrition goals. The confidence in and achievement of the SMART nutritional goals of participants in the lifestyle intervention program could imply that these nutritional self-efficacy strategy components were not different for men and women. Although a deeper analysis of those goals could reveal differences in the type of goals chosen by men and women, these results suggest that it is reasonable to teach and integrate the SMART nutrition-oriented goal approach in the same manner for both sexes. Funding: Public Health Agency of Canada.

Prévalence du surpoids et de l'obésité chez des femmes immigrantes africaines subsahariennes et caribéennes habitant à Ottawa : Résultats préliminaires

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Objectifs : 1) Décrire les caractéristiques anthropométriques de mères originaires d'Afrique Subsaharienne et des Caraïbes ayant un enfant âgé entre 6 et 12 ans, et 2) évaluer l'impact de

la région d'origine et de la langue officielle préférée sur les caractéristiques anthropométriques. **Méthodes** : Cent vingt-sept mères ont été recrutées entre janvier et août 2014 à Ottawa. Leur langue officielle préférée a été déterminée à l'aide d'un questionnaire. Leur taille, poids et tour de taille (TT) ont été mesurés, et l'indice de masse corporelle (IMC) a été calculé. Le surpoids a été défini comme un $IMC \geq 25.0 \text{ kg/m}^2$ et $< 30.0 \text{ kg/m}^2$, et l'obésité comme un $IMC \geq 30.0 \text{ kg/m}^2$. La comparaison de l'IMC et du TT des femmes en fonction des préférences linguistiques et de la région d'origine a été faite à l'aide d'une analyse de covariances. **Résultats** : Les femmes étaient âgées de 39.7 ± 6.1 ans. Près de la moitié (45.7%) étaient obèses et 79.5% étaient en surpoids ou obèses. Similairement, plus du trois quart des femmes (79.5%) avaient un TT dépassant le seuil associé avec un risque accru de développer des maladies chroniques ($\geq 80.0 \text{ cm}$). Les femmes caribéennes avaient un TT significativement plus élevé ($p < 0.05$) que les femmes africaines, alors que les préférences linguistiques n'étaient pas associées au TT. Aucune différence significative n'a été observée au niveau de l'IMC. **Implications et conclusions** : Une grande prévalence de surpoids et d'obésité a été observée chez ces participantes. De plus, nos résultats indiquent que les femmes immigrantes caribéennes pourraient être à plus grand risque cardiométabolique que les femmes immigrantes africaines en raison d'une plus grande adiposité abdominale. Ces résultats préliminaires appuient la nécessité de développer des interventions mieux adaptées aux minorités visibles canadiennes, en tenant compte du groupe ethnique et de l'origine géographique, afin de réduire les disparités présentes en matière de santé. Financement : CNFS

Exploring the healthy foods school aged children would like to be served in schools and recreation facilities and evaluating the use of the Draw and Write Technique as a qualitative research method

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Objectives: The objectives of this research were to learn about the types of healthy foods children wanted to be served in schools and recreation facilities, and to pilot the *Draw and Write Technique* as a qualitative research method with school-aged children. **Methods:** 30 children aged 5-12 years were recruited to participate in information gathering sessions held at two Summer Day Camps in the Annapolis Valley, Nova Scotia. Participants were asked two questions regarding healthy foods they would like to be served in schools and recreation settings. Responses were the participants' drawings. Information from the drawings was coded and analyzed thematically. **Results:** Analysis of the material revealed three themes for preferred foods; pizza, fruits, and vegetables. Participants appeared to understand the purpose of the information gathering method, and expressed excitement about the use of drawing as a way to gather information. **Implications & Conclusions:** Gaining perspectives regarding the types of foods children want to be served in schools and at recreation facilities can assist schools and recreation settings with implementation of healthy eating policies. The results obtained supported current programs and initiatives currently in place in the Annapolis Valley. These programs and initiatives include Strive for Five Cookbook, Farm to School Program and Edible Garden Initiatives, which have a common goal of increasing fruit and vegetable intake among school aged children. The *Draw and Write Technique* presented opportunities and weaknesses to be further explored by pairing the method with audio or video recording to generate thorough information.

Interesting shapes of vegetables: Is it a strategy to promote consumption among preschool children?

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Objectives: This study highlighted the low intake of vegetables among preschool children and determined whether changing the shape of vegetables increased their level of consumption. Vegetables are less desirable compared to more attractive unhealthy choices available to children, and discovering a strategy to promote vegetables is important. The aim of the study was to explore the effect of repeated exposure to interesting-shaped vegetables on consumption. The other aim was to determine the level of accessibility of vegetables at home and its influence on children's consumption. **Methods:** This quasi-experiment compared the amount of consumption between different days and different vegetable shapes. Forty-two preschool children aged 2-5 years attending four different day care centers in London, Ontario, Canada were provided on the 1st day with natural-shaped vegetables (carrot, cucumber, sweet red pepper) to determine their baseline consumption of uncut vegetables. They were provided later with the same vegetables cut in interesting shapes (flower, star and owl/bat) with or without a preferred dip. On the 8th day of the experiment, the natural-shaped vegetables were provided again to determine how the interesting shapes influenced their consumption of the natural-shaped vegetables. **Results:** The preschool children's consumption of natural-shaped vegetables increased by 11% on the final day of the experiment. Providing preferred dips with the vegetables did not increase their consumption of vegetables. Repeated exposure to interesting-shaped vegetables seemed to increase the preschool children's liking and consumption of vegetables and improved their eating experiences. Accessibility of vegetables at home did not have any effect. **Implications and Conclusions:** With no recommended best approach to increase children's intake of vegetables, caregivers/parents or dietitians must find ways or adopt methods to influence positively children's consumption. There is a need to understand children's perception of vegetables and factors in their social and physical environments that influence their eating behavior.

NutriSTEP use in a rural community setting and implications for public health and primary health care practice

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Background: Grey Bruce Health Unit (GBHU) is currently working towards a comprehensive implementation strategy of NutriSTEP (Nutrition Screening Tool for Every Preschooler), a standardized and validated nutrition screening tool for toddlers (aged 18 to 35 months) and

preschoolers (aged 3 to 5 years). Primary health care (PHC) partners are considered to be integral to the successful implementation of NutriSTEP in communities including consistent screening and appropriate referrals. **Objectives:** The primary objective was to understand the perceived barriers and enablers as identified by PHC sites regarding NutriSTEP use. The secondary objective is to examine how PHC sites interpret results, provide feedback to parents and initiate referrals when needed. The results from this project will inform a Grey Bruce approach for implementing standardized screening tools such as NutriSTEP. **Methods:** Key informant semi-structured interviews took place throughout Grey Bruce, in-person (9) and by telephone (1) with PHC sites. Interview transcripts were assessed using qualitative thematic content analysis to identify, code and categorize the primary patterns and recurring themes in the data. **Results:** Of the ten PHC sites interviewed, five had not used NutriSTEP and six did not have a Registered Dietitian employed. Of the four PHC sites that had a Registered Dietitian on staff, all were using NutriSTEP. The main perceived barriers to NutriSTEP use were lack of time and lack of target group. The perceived enablers to NutriSTEP use were education/training, Information Technology (IT) support, nutrition expertise, ease of tool, and inter-professional collaboration. **Implications and Conclusions:** The results suggest that the successful implementation of NutriSTEP in rural PHC sites depends on a strong relationship with Public Health for educational and training purposes, having a Registered Dietitian on staff, internal IT support, well-developed referral processes, and inter-professional collaboration among healthcare professionals.

Flavonoids in Selected Wild Edible Tropical African Fruits

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Flavonoids are phenol derivatives in plants known to protect people against degenerative diseases like cardiovascular disorders, diabetes, hypertension and cancer. This study evaluated the flavonoid of selected wild edible African fruits in Uganda using spectroscopic and thin layer chromatography techniques. The results showed that *Carissa edulis*, *Saba comorensis*, *Vanguria apiculata* and *Canarium schwenfurthii* contained; 7.33±1.15, 52.00±2.00, 15.33±1.15, 27.33±2.31% flavonoid content, respectively. Further analysis of flavonoids as rutin showed 7.73, 48.34, 35.91 and 36.73 mg/g, respectively. The flavonoids; apigenin, rutin, quercetin and myricetin were identified in *C. edulis*; quercetin, rutin, kaempferol and apigenin in *S. comorensis*; quercetin, apigenin and Chrysoeriol in *V. apiculata* while chrysoeriol, rutin and kaempferol in *C. schwenfurthii*. This study showed that tropical African fruits like *C. edulis*, *S. comorensis*, *V. apiculata* and *C. schwenfurthii* fruits contain a significant amount and a diversity of flavonoids which are important in the management of chronic diseases. Future research should focus to establish the mechanism by which combinations of these flavonoids work in prevention of diseases.

Early nasojejunal feeding in severe acute pancreatitis (SAP) – A Prospective study

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Background and objectives: The nutritional status of the patient is severely affected in severe acute pancreatitis (SAP). This prospective study was carried to assess the tolerance and outcome of early naso jejunal tube feeding within 24-48 hours of admission. **Methods;** 60 patients of SAP were given naso- jejunal feeding via endoscopically inserted NJFT within 24-48 hours of admission. The volume of feeds was increased as per the tolerance of the patients. The patients were divided in group A (who tolerated the feed) and group B (who did not tolerate the feed). The patients were followed by biochemical parameters, duration and amount of feed tolerated. The patient outcome was noted and the results were statistically analysed.

Results; 54 (90%) patients tolerated the naso jejunal feed, reached the goal feed volume and were subsequently started on oral feeds. No NJFT insertion complications were recorded in any group. In group B number of complications ($p=0.048$) and duration of stay in ICU ($p=0.04$) were significantly observed as compared to group A. All nutritional parameters improved in group A with significant improvement in biochemical parameters as improvement in serum albumin, serum calcium and fasting blood glucose levels. **Implications and Conclusions:** Early naso jejunal feeding in severe acute pancreatitis is effective and economical method of providing nutrition. The mortality, morbidity and hospital stay was significantly less in group A (who tolerated feed).

Knowledge, attitudes, and clinical practice towards prenatal calcium among Family Physicians

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Objectives: To survey practicing Family Physicians (FPs) with regards to their nutrition-related knowledge, attitudes, and clinical practice towards prenatal calcium. **Methods:** 500 surveys were mailed out to randomly selected FPs across Manitoba. **Results:** Overall, 111 surveys were completed (22.2% response rate). Respondents were 49.5% male, 48.6% practicing for 21 years or more, and 51.4% working outside of Winnipeg. Most FPs (73.9%) scored correctly on calcium dosage (500-600 mg) in over the counter (OTC) calcium supplements; 71.2% correctly identified the amount of calcium in 250 mL cow's milk (300 mg); and 71.2% correctly identified that most Canadian women aged 19 to 50 years are not meeting current calcium recommendations. Only 32.4% correctly identified the recommended daily amount of calcium (1000 mg) and 64.9% correctly identified a higher risk for preeclampsia, preterm delivery, or maternal bone loss with low calcium consumption (<600 mg/day). Only 36.0% of FPs routinely discuss calcium requirements with their prenatal patients and most (71.2%) did not suggest OTC calcium supplements within the last month. The top three barriers identified by FPs for

providing calcium advice were: more urgent issues (26.4%), lack of time (22.6%), and forgetting to do so (22.0%). Despite this, over half of respondents rated receiving prenatal nutrition education as very important (23.4%) or important (35.1%). The majority of FPs (82.9%) do not refer their prenatal patients to a Registered Dietitian (RD). **Implications & Conclusions:** Since adequate calcium intake is important for maternal and fetal health, it is essential that pregnant women are educated on the importance of meeting their calcium requirements. Our findings suggest that many FPs are not providing calcium advice to their prenatal patients, or utilizing RD services. RDs can play a key role in developing educational programs to enhance FP nutrition knowledge. Initiatives to reduce barriers to providing nutrition advice are needed.

Effect of high-dose vitamin D supplementation on bone density in youth with osteogenesis imperfecta: A randomized controlled trial

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Background: Osteogenesis imperfecta (OI) is a genetic disease characterized by fragile bones and short stature. A recent study showed serum 25-hydroxyvitamin D (25OHD) concentrations to be positively associated with lumbar spine areal bone mineral density (LS-aBMD) in patients with OI. **Objectives:** To assess whether high-dose vitamin D supplementation will result in significantly higher LS-aBMD z-scores after one-year; and to evaluate the effect of vitamin D supplementation on lower limb muscle power assessed through jumping mechanography. **Methods:** Patients were randomized in equal number to receive either 400 or 2000 international units (IU) of vitamin D supplements and stratified according to baseline bisphosphonate treatment status and pubertal stage. **Design:** A one-year double blind randomized controlled trial conducted at the Shriners Hospital for Children in Montreal. **Participants:** Sixty children and adolescents with OI (female, n=35; male, n=25; age 5.9 to 18.9 years; mean 11.7 years, SD 3.2) participated. **Results:** At baseline, average serum 25OHD concentration was 65.6 nmol/L (SD 20.4) with no difference seen between treatment groups (p=0.77). Inadequate serum 25OHD concentrations (<50 nmol/L) were measured in only 21% of patients at baseline. Supplementation resulted in higher serum 25OHD concentrations in almost all participants (90%) with significantly higher increases seen with 2000 IU (mean [95% C.I.] = 30.5 nmol/L [21.3; 39.6] vs 15.2 nmol/L [6.4; 24.1], p= 0.02). No significant changes were detected in aBMD measurements or in lower limb muscle power between treatment groups from baseline to final visit. **Implications & Conclusions:** Supplementation with either 400 or 2000 IU of vitamin D translates into significant increases in serum 25OHD concentrations in children with OI. However, increases in baseline serum 25OHD concentrations already within a healthy range (≥50 nmol/L) do not translate into increases in aBMD z-scores in children with OI.

The Perceptions of Sustainable Food Practices at Acadia University

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Objectives: The purpose of this study was to determine Acadia students' perceptions of sustainable food practices on campus, as well as characterize their knowledge and attitudes to guide the food services on campus to cater suitable information about their practices. **Methods:** Research on the perceptions of sustainable food practices at Acadia University was collected through an online survey, administered via e-mail and social media to students who attend Acadia University. The survey asked students questions regarding their thoughts on sustainability practices on campus, their general knowledge on the practices currently happening on campus and how they would like to learn more about food sources available through dining services. A focus group was also hosted to obtain students' general opinions about the food services at Acadia University. **Results:** The survey revealed that 30% of students (n=150) were not aware of the sustainable food practices occurring on campus. When asked how they felt about the current sustainable food practices happening at Acadia, only 9% stated they were satisfied. Students indicated that they were interested in learning more about sustainable food practices that occur on campus, however they would not actively seek out this information. Social media campaigns were the method of choice to receive this information. During the focus group, students expressed more concern for the quality of the food rather than its source. **Implications & Conclusions:** Although making sustainable food practices on Acadia University campus common knowledge is an important goal, greater emphasis should be put on educating students about what is happening behind the scenes to make feeding over two thousand students possible. If students were made aware of the effort to provide them with top quality ingredients and dishes, they would have a greater appreciation for the sustainable efforts that are in place.

Impact du niveau socio-économique des quartiers sur l'indice de masse corporelle et la circonférence de taille de femmes africaines et caribéennes vivant à Ottawa

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Objectif : L'objectif de cette recherche est d'explorer l'impact du niveau socio-économique (NSÉ) des quartiers sur l'indice de masse corporelle (IMC) et la circonférence de taille (CT) chez des femmes africaines et caribéennes vivant à Ottawa. **Méthodologie :** L'IMC et la CT de 139 femmes ont été mesurés par une diététiste entre janvier et juillet 2014. Les femmes ayant une maladie pouvant influencer la CT ou le poids, ou celles qui allaitaient ou étaient enceinte au moment de l'entrevue ont été exclues (n=15). Les participantes ont été classées selon leur quartier à partir de « L'étude des quartiers d'Ottawa » (<http://neighbourhoodstudy.ca/fr>). Le NSÉ des quartiers a été évalué en utilisant des indicateurs socio-culturels et économiques choisis à partir de cette même étude. Les quartiers ont ensuite été regroupés en

tertiles. StatCrunch© et Excel© ont été utilisés pour l'analyse statistique. Résultats : Les participantes (n=124) avaient en moyenne 39,1 ans, une CT de 97,8 cm et un IMC de 30,6 kg/m². L'analyse de variance n'a révélé aucune différence significative entre le NSÉ du quartier et l'IMC ou la CT des participantes (p=0,74 et p=0,44, respectivement). **Implications et conclusions** : Ces résultats préliminaires suggèrent que le NSÉ du quartier n'a pas eu d'influence sur l'IMC et la CT chez ces femmes africaines et caribéennes. Cependant, la majorité des participantes avaient un poids dans la catégorie obésité et sont par conséquent à haut risque de développer des problèmes de santé. Cette recherche révèle le besoin d'étudier les déterminants sociaux de la santé et leur influence sur les habitudes alimentaires et l'activité physique des femmes africaines et caribéennes vivant dans la capitale du Canada. Une meilleure compréhension de ces déterminants permettra de mieux cibler les interventions et d'aider à prévenir le gain de poids excessif. Financement : CNFS–volet Université d'Ottawa.

Impact du niveau socio-économique du quartier sur la consommation de breuvages sucrés chez les enfants d'âge scolaire en situation minoritaire vivant à Ottawa

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Objectif : Puisque des études démontrent une relation inverse entre le statut socio-économique et la consommation de breuvages sucrés (BS) des enfants, notre objectif est d'explorer la relation entre le niveau socio-économique (NSÉ) du quartier et la consommation de BS d'enfants d'âge scolaire en situation minoritaire vivant à Ottawa. **Méthodologie** : Les données de 154 enfants de 6 à 12 ans de descendance africaine et caribéenne (anglophones ou francophones) ou de descendance canadienne francophone ont été analysées. Les portions de BS ont été calculées à l'aide d'un rappel de 24 heures administré par une diététiste. Une portion correspond à 125 ml de boissons sucrées à saveur de fruits, de boissons gazeuses ou de chocolat chaud fait à base d'eau, et exclue les jus de fruits. Dix indicateurs socio-économiques de l'Étude de quartiers d'Ottawa (<http://neighbourhoodstudy.ca/fr/>) ont été sélectionnés pour classer les quartiers selon leur NSÉ. Les quartiers ont ensuite été regroupés en tertiles. Les analyses statistiques ont été effectuées avec StatCrunch. **Résultats** : Près de la moitié des enfants (49 %) ont consommé des BS la journée précédant l'entrevue. Les consommateurs en ont bu en moyenne 2,8 portions. Il n'y avait pas d'association significative entre le NSÉ du quartier et la consommation de BS chez ces enfants (p=0.46). **Implications et conclusions** : Il ne semblait pas y avoir de relation entre le NSÉ du quartier et la consommation de BS chez ces enfants en situation minoritaire. L'analyse des rappels de 24 heures de l'ensemble des participants de l'étude permettra de mieux explorer la relation entre le NSÉ du quartier et la consommation de BS. Plus d'études chez les enfants canadiens et néo-canadiens d'âge scolaire seraient utiles pour comparer nos résultats finaux et ainsi guider les interventions futures. Financement : CNFS - volet Université d'Ottawa.

Assessing the sustainability of school breakfast programs in Manitoba: A qualitative approach

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Aim: To assess key informants' perceptions of the sustainability of school breakfast programs (SBP) in Manitoba and to identify factors that may threaten or help secure their long-term existence.. **Purpose:** To assess long-term sustainability of Manitoba SBP by examining the beliefs, attitudes and values of the diverse stakeholders involved in ensuring that SBP run. **Sample/ Setting:** Eleven participants from four schools, four participants from three private funding organizations and three decision-makers from three government departments within Manitoba . **Method:** Semi structured in-person and telephone interviews were conducted to explore the perceptions, attitudes, and experiences of government personnel, funders, superintendents, school principals and SBP program coordinators. **Results:** The perceived impact of SBP varied between each group of stakeholders though all shared a common belief that SBPs were beneficial to students. Major barriers identified were related to funding and manpower. Solutions proposed included collaborative funding models, developing partnerships with university nutrition programs, and promoting awareness of the benefits of SBP in the community, leading to increased community support. **Conclusion:** Each key informant group provided unique insights into the sustainability of SBPs. All stakeholders continue to support SBP because they understand and value the positive health, educational and social benefits SBP have for students and the wider school community. However, funding dilemmas and operational challenges identified in this study need to be addressed in order to ensure longer-term program sustainability. **Implication:** The long-term sustainability of SBP depends on creating and maintaining a positive policy environment in which SBP are seen as a valuable tool in supporting child nutrition so that funding and resources are allocated appropriately . Findings from this study provide pointers as to what is necessary to achieve this.

Cultural competence and education opportunities among dietetic students in an Ontario university

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Objectives: To conduct Canadian research assessing nutrition students' cultural competence, and to identify areas for future education initiatives in dietetic education. **Methods:** A 24-question mixed-methods questionnaire was developed and administered to students enrolled in 3rd and 4th year undergraduate nutrition classes (n=133) at Brescia University College. **Results:** 115 questionnaires were analyzed for quantitative data, and 109 were analyzed for qualitative data. Student's scored an overall medium-high level of cultural competence, with scores generally ranging from 53-60 (IQR) out of 75. In the five areas examined (skills, attitudes, awareness, desires, knowledge), student's multicultural knowledge scores were the lowest. It was found that a lower number of barriers to learning about other cultures were significantly associated with a higher overall cultural competence score. Taking a course in cultural foods significantly increased students' knowledge and overall cultural competence ($P \leq$

0.05). The qualitative data found that students felt the cultural competence curriculum had gaps and cited several ideas for improvement. Suggestions included: a larger component on cultural competence within the curriculum, creating a mandatory cultural foods class, and more opportunities for cultural experiential learning. Students stated that exposure to other ethnicities as being beneficial in developing cultural competence. It was reported that the curriculum was effective in emphasizing cultural sensitivity, patient-centered care and the importance of adapting nutrition care to the needs of every patient. **Implications & Conclusions:** Cultural competence has been integrated throughout the Integrated Competencies for Dietetic Education and Practice [ICDEP] standards. Thus, it is imperative that academic institutions are cognizant of how they are training future dietitians to become culturally competent. As of right now, there is no Canadian research examining the cultural competence of dietetic students. This study provides novel insights into the cultural competence of Canadian dietetic students, and ideas for curriculum advancement. Further research is needed.

The use of dairy milk as an ergogenic aid among elite athletes in Manitoba

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Objective: There has been growing literature suggesting that dairy milk may have the same effects as many ergogenic aids that are available to athletes today. Therefore, from a practical standpoint, the purpose of this study was to evaluate the use of dairy milk and dietary supplements for exercise performance among elite athletes. **Methods:** A paper-based, 13-question survey was used to capture the perspectives and use of milk for exercise performance from a convenient sample of competitive athletes from various sports teams at the provincial level or higher, throughout Manitoba. Data were analyzed by descriptive statistics using SPSS statistical software. **Results:** One hundred and sixty two athletes completed the survey, comprising 58 males, 104 females, average age: 20.9 ± 4.5 years, average training hours per week: 16.3 ± 5.1 hours, from several sports in Manitoba (soccer, hockey, wrestling, volleyball, ringette, wheelchair basketball, synchronized swimming, and curling). Overall, 66.3% of athletes reported daily usage of dietary supplements, while 51.9% of athletes who use dietary supplements consume dairy milk as part of their exercise program, with chocolate milk being the preferred beverage (54.6%). Interestingly, athletes reported consuming sports drinks/electrolytes (28.7%), protein supplements (21.3%), Vitamin D (12.2%) and Calcium (3.2%), all of which contribute to the nutritional composition of dairy milk. In general, dietitians/nutritionists (32.4%), trainers (19.1%), advertisements (17.2%) and coaches (15.7%) were most often identified as sources of information regarding dairy milk for exercise performance. **Implications & Conclusions:** These results indicate that athletes are consuming dietary supplements containing nutrients commonly found in dairy milk. These supplements may not be necessary due to the ergogenic properties of milk alone for exercise performance. Thus, results from this study may lead to future educational opportunities for dietitians and nutrition professionals to offer more focused advice to their clients.

Influence of lunch bag and ice pack type on food temperatures of sample lunches over 6 hours

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Objectives: To determine if lunch bags and thermal/cooling equipment maintain safe food temperatures. **Methods:** Eight lunch bags were tested: uninsulated-plastic bag; one- and two-compartment Microban[®] bags; one- and two-compartment polyurethane-lined bags; ethylene-vinyl-acetate one-compartment bag; polyethylene one-compartment bag; and built-in icepack bag. Three thermal/cooling conditions were used: no thermal/cooling equipment; thermos and one solid icepack; and thermos and built-in icepack containers. Six sample lunches, containing cold- and hot-food items, were packed into each of the lunch bags and thermal/cooling conditions. Infrared thermometer temperatures were recorded after packing each lunch (time 0) and hourly, for 6 hours. **Results:** Mean temperatures of cold-entrees, dairy, and hot-entrees at time 0 were $7.5 \pm 2.4^{\circ}\text{C}$, $4.4 \pm 1.8^{\circ}\text{C}$, and $74.1 \pm 6.4^{\circ}\text{C}$, respectively. At 0 hour for cold-entrees, and 1 hour for dairy and hot-entrees, mean temperatures were within the danger zone (4°C - 60°C) ($7.5 \pm 2.4^{\circ}\text{C}$, $9.0 \pm 4.0^{\circ}\text{C}$, and $51.3 \pm 13.4^{\circ}\text{C}$, respectively). The temperatures of cold items (entrees and dairy) in the built-in icepack bag ($8.8 \pm 3.1^{\circ}\text{C}$) was significantly different from all other bag types, ranging from 13 - 15°C ($p < 0.001$). For hot-entrees the built-in icepack bag ($35.5 \pm 12.2^{\circ}\text{C}$) was significantly lower from all other bag types, ranging from 42 - 46°C ($p < 0.05$). Cold-item temperatures were significantly higher ($17.2 \pm 3.1^{\circ}\text{C}$) with no icepacks compared to 10 - 13°C when either a solid or built-in icepack was used. With no thermos the mean hot-entree temperature was significantly lower ($33.2 \pm 5.35^{\circ}\text{C}$) than the other conditions using thermoses (47 - 48°C). **Implications and conclusions:** Food items entered the danger zone within 1 hour of packing. The built-in icepack bag was the most effective at maintaining the lowest temperature of cold-food items; however, should not be used for hot-entrees even with a thermos. School-children consume their packed lunches about 4-5 hours after preparation, and are consuming foods that have been in the danger zone for longer than the 2-hour recommended maximum.

Understanding Perceptions of Food Access Issues and Responding Initiatives in Fort Providence, NWT

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Objectives: In Northern Canada, prolonged exposures to a number of stressors impact the ability of remote, Indigenous communities to maintain food security. I will discuss the challenges and opportunities a community in the Northwest Territories faces in achieving regular access to nutritious land-based and market foods. My objectives are to (a) highlight the perceptions of food access in the community, (b) examine the initiatives developed within the local school to create greater access to foods and, (c) discuss the structure of a successful food procurement program. **Methods:** This research is based on six months of ethnographic research in Fort Providence, Northwest Territories. The research is community-based with direct collaboration

with key representatives to identify needs and address locally defined issues of food access. The programs examined are developed within the school and largely community-driven.

Results: The results are detailed accounts of the perceived challenges pertaining to food security, access and land-based food procurement. Interviews with elders, parents and community champions detail the sociocultural, economic and environmental barriers to achieving food security. Further, the programs examined suggest opportunity for the development of land-based food procurement skills for youth and opportunity for community building. **Implications & Conclusions:** Local, community driven, land-based food procurement programs are helpful in responding to issues of food access and contribute to overall community well-being. They promote education, cultural continuity, community and skill building. It is found that the viability of the programs are largely dependent on funding and access to human capacity causing the sustainability of the programs to be vulnerable to external factors.

Prenatal nutrition in team-based care: A qualitative investigation of current practices and opportunities for collaborative optimization of care

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Objectives: To describe the nature of prenatal nutrition care currently provided by Family Health Teams (FHTs) and Community Health Centres (CHCs) in Ontario, from the perspectives of health care providers. This research aims to identify opportunities for optimization of team-based prenatal nutrition care. **Methods:** In total, 73 health care providers working in FHTs and CHCs participated in ten, one-hour, interdisciplinary focus groups. Each focus group involved 3 to 11 team members with a minimum of 3 different health care professions. Data were analyzed using descriptive analysis. **Results:** The structure of each participating FHT and CHC was unique, with regards to the number of team members, the composition of professions, and the individual roles of each team member. Results showed that although the roles of the different health professionals varied greatly from team to team, it was consistently found that health care providers of various disciplines take responsibility for providing prenatal nutrition care. Health care providers described interdisciplinary collaboration, involving both shared care and community outreach, as important components for the provision of high quality prenatal care. Key processes of team-based prenatal nutrition care included developing patient rosters, choosing the primary prenatal caregiver, and providing comprehensive routine prenatal visits. Participants perceived that patient choice, provider scope of practice and available resources played dynamic roles in these processes, as they influence when, how and by whom prenatal nutrition care is delivered to pregnant women. **Implications & Conclusions:** This study provides a description of the current state of prenatal nutrition care delivered in team-based models, and reveals opportunities and strategies to optimize this care for all pregnant women living in Ontario. Sharing current practices in prenatal care will guide researchers and practitioners towards creating more efficient practices, user-friendly nutritional assessment and education tools, and effective processes of interdisciplinary collaboration.

Transparency Phenomenon in Dried Rice Noodles and its Function in Dietary Purpose

Muhammad Heikal Ismail, Law Chung Lim, Hii Ching Lik

In maintaining food quality and shelf life, drying is employed in food industry as the most reliable perseverance technique. In this way, heat pump drying and hot air drying of fresh rice noodles was deduced to freeze drying in achieving quality attributes of oil content in terms of Scanning Electron Microscope (SEM) images, texture, oil content and colour. Soxhlet analysis shows that both dried noodles contain less than 2 times oil content, continuous pores of SEM images, lower hardness by less than two times, and wider colour changes by average more than two times to both methods to explain the transparency physical outlook of hot air and heat pump dried samples to the freeze dried samples.

Social Barriers in Nutrition and Mental Health

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Objectives: The purpose of this thesis was to gain an understanding of the social conditions that preserve stigma and health inequalities in nutrition and mental health, and to obtain information on how these conditions may influence the efficacy of nutrition programs, resources, or services for mental health prevention and treatment. Mental health is a critical facet of overall health and well-being, and nutrition has increasingly been recognized as an essential aspect in the prevention and treatment of mental illness. However, both mental health and nutrition are affected by social challenges such as marginalization, stigmatization, discrimination, and health inequalities. Though the issues are recognized to an extent, social barriers in mental health and nutrition have not been researched in an extensive manner. **Methods:** This qualitative study involved one-on-one structured interviews with nutrition and mental health professionals (n=6) participating in research or policy work. The interviews were recorded, transcribed, and analysed for common themes. **Results:** Analysis resulted in the identification of the following themes and recommendations for action: there are specific social beliefs that interfere with health care through stigma and discrimination at individual, provider, and structural levels; certain populations are most vulnerable to these effects, whereas others benefit; poverty must also be addressed along with stigma and discrimination, in order to provide comprehensive health care; addressing social barriers must include changes to primary care, collaboration at all levels, implementation of social support, and political action. **Implications & Conclusions:** Implications on guidelines for integrating nutrition care into mental health are discussed. This information may be used to inform future research and improve nutrition interventions for mental health prevention and treatment.

Is there an association between dietary protein intake, Nordic walking exercise, and sarcopenia risk factors?

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Objectives: Exploring preventive and clinical management strategies for sarcopenia is urgently needed with the reported 33% prevalence of sarcopenia in the community, and the global aging milieu. To the best of our knowledge, no study on the association of dietary protein intake, Nordic walking exercise (characterized by the use of two walking poles) and sarcopenia risk factors based on the European Working Group on Sarcopenia in Older People consensus definition (low muscle mass + low muscle function) has been reported. **Methods:** This cross-sectional study investigated the relationship of sarcopenia risk factors in healthy community-dwelling individuals aged 45-74 years participating in Nordic walking or regular walking exercise (control). The influence of dietary protein intake was investigated as a potential confounding factor. The primary outcomes were muscle and fat estimates from Bioelectrical Impedance Analysis, body circumference measures (waist, hip, mid-thigh), appendicular muscle mass corrected for height (aMM/Ht²), and muscle strength (function) as measured by handgrip dynamometer. **Results:** All participants (n=37) tested normal for handgrip strength. Eleven percent of participants met the criteria for low muscle mass (aMM/Ht²). Although not statistically significant, there was a tendency for the Nordic walking group to have more favorable body composition (% body fat: $p=.39$; % appendicular muscle mass/kg body mass: $p=.40$; waist-to-hip ratio: $p=.21$) and handgrip strength (kg/BMI: $p=.72$). Our study revealed an inverse correlation between dietary protein intake and percent body fat ($r=-0.73$; $p<.001$), a positive correlation between dietary protein and lean mass ($r=0.73$, $p<.001$), and between dietary protein and muscle strength ($r=0.55$, $p=.005$). **Implications & Conclusions:** There appears to be associations between dietary protein intake, physical activity, and sarcopenia risk factors as revealed in measurements of body composition, circumferences, and handgrip strength. Nordic walking exercise compared with regular walking may be more beneficial in decreasing sarcopenia risk factors, however further studies are warranted.

The adult patient's experience with short-term tube feeding in acute care

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Objectives: Short-term tube feeding (TF) for adults admitted to acute care is a frequently-prescribed therapy for preventing or ameliorating malnutrition. Since the extant literature only provides insight into the physical and psychosensory discomforts experienced by this patient population, our objectives were to investigate the overall experiences with short-term TF, and factors influencing those experiences, to better inform Dietitian's patient-centered practices. **Methods:** Dr. Sally Thorne's Interpretive Description qualitative research approach was chosen to investigate the experiences of individuals receiving short-term TF (i.e. initiated in hospital), admitted to medical or surgical units of three acute care hospitals in Northern Ontario, Canada. Following Ethics and Institutional approvals, interviews were conducted with those who

volunteered to elicit their stories. Constant comparative analysis, and indexing and categorizing techniques were applied to describe the phenomenon of the patient's experience receiving short-term TF in acute care. **Preliminary Results:** Findings to date, reveal experiences of substantial pain with feeding tube insertion, burden from the technicalities of tube maintenance, and fear associated both with underlying illness and the inability to eat. Although participants found Dietitians and nursing staff engaged and attentive, TF was not well-explained and therefore they reported poor understanding of TF. Participants were nonetheless resilient, cleverly troubleshooting TF problems. They expressed gratitude for the life-saving benefits of TF as well as for the support from family. Recommendations included early provision of a verbal and written explanation about TF and the goals of TF care. **Implications and Conclusions:** These preliminary results illuminate the importance TF therapy holds for acutely ill patients and the need for Dietitians to ensure that discomforts are minimized and that patients are well informed about TF therapy and the expectations of their care. When a Dietitian understands a patient's perspective about TF, patient-centered practices can be enabled with the potential of influencing outcomes.

Improving access to healthy food: Next steps for the Healthy Eating Team

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OBJECTIVES: To support the Healthy Eating Team (HET) in decreasing incidence of food insecurity in Northern Saskatchewan and improving the current food environment through involving northern food businesses. The research question of "from the perspective of store owners, what tools, incentives, and resources can the HET produce to support the promotion of healthy foods in convenience and grocery stores in Northern Saskatchewan?" was examined in this qualitative study. **DESIGN AND METHODS:** Using purposive sampling, letters of invitation were sent to 39 grocery and convenience store owners or operators across Northern Saskatchewan. A 15% participant response rate was achieved and telephone interviews were completed using a semi-structured interview guide. Participant responses were analyzed thematically. **RESULTS:** Analysis showed that Northern Saskatchewan storeowners believe people in their communities are becoming more receptive to healthy eating, and appear to be making healthier food choices. Customers are hindered by barriers to purchasing healthy food such as increased cost due to shipping and lack of food and nutrition knowledge. **RECOMMENDATIONS AND CONCLUSIONS:** Study participants indicated that more direct and consistent contact with the HET is needed, either in-person or through the use of social media platforms. To increase customer knowledge, participants indicated that nutrition education provided by registered dietitians in stores and/or professionally printed information sheets and newsletters would be valuable.

Quality improvement in dietetics

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Background: Quality improvement (QI) initiatives have been implemented in a vast number of organizations and structures. The Saskatchewan healthcare system is in the process of implementing Lean Management. Registered dietitians (RDs) in Saskatchewan are involved in QI efforts; however, it is not known to what extent. **Objective:** To determine the QI knowledge and experiences of Saskatchewan RDs working in population health, community, and nutrition care settings. **Methods:** A self-administered online survey, which consisted of yes-or-no, multiple choice, and open-ended questions, was conducted in January 2015. **Results:** A total of 62 RDs (response rate of 47.7%) completed the survey. The following themes were pulled from the study: 1) RDs are aware of some basic QI concepts, particularly those related to Lean; 2) RDs incorporate QI into their area of practice in various ways, despite the fact that a majority of them have not participated in a Lean project (74.2%, n = 46); 3) Most RDs have received informal QI education (66.1%, n = 41), experienced barriers to QI implementation (88.7%, n = 55), and expressed a desire for more support and direction in QI application; 4) RDs experience a disconnect between the theoretical knowledge and practical application of QI; and 5) Future RDs may be better equipped to integrate Lean concepts into their practice, as many recent graduates reported learning about Lean through their undergraduate education (37.1%, n = 23). **Implications & Conclusions:** RDs want more experience via training and/or participation in Lean projects; more information on how to practically apply QI in their practice; more direction on how QI can be achieved in a public health setting; and more information on how to better integrate Lean into dietetic practice. Additional research is required to identify ways of translating and applying Lean initiatives in community and public health settings.

In adolescents and adults, how does the use of cognitive behavioural therapy compare with the use of standard nutrition counselling to achieve nutrition-related goals?

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OBJECTIVE: A literature review was conducted to contribute to the Practice-Based Evidence in Nutrition[®](PEN) Counselling Strategies Knowledge Pathway. The practice question asked the effect of the use of cognitive behavioural therapy (CBT) on the achievement of nutrition-related goals in adolescents and adults compared with the use of standard nutrition counselling alone. **METHODS:** An extensive literature search, using key words: cognitive behavioural therapy; nutritional counselling; nutritional management; eating behaviours; adults; adolescents, yielded five randomized controlled trials, two randomized trials, a quasi-experimental study and a prospective study examining the use of CBT alone and in combination

with other interventions (e.g. nutrition education, dietary modifications, pharmacological interventions) in adults and adolescents. The sample population examined varied extensively in these studies (e.g. obese adult females with binge eating disorder, morbidly obese adults eligible for bariatric surgery, overweight and obese adolescents, subjects on dialysis etc.). PEN[®]evidence-based process and writer's guidelines were followed for searching for, critiquing and evaluating the literature, and construction of evidence statements and Key Practice. **RESULTS:** CBT used both alone and in combination with other interventions is more effective than standard nutritional counselling alone in instilling healthy eating habits, promoting positive body image, improving psychological outcomes (e.g. reducing signs and symptoms of depression) and decreasing weight in obese adults with or without binge eating disorder, and in overweight/obese adolescents. The use of CBT was also found to have positive effect on compliance to fluid restrictions among adults undergoing hemodialysis and peritoneal dialysis. **IMPLICATIONS/ CONCLUSION:** Overall, the use of CBT, both alone and combined with other interventions, can positively impact the achievement of nutrition-related goals in adults. The impact of CBT on overweight/obese adolescents is inconclusive due to limited research in the population. Studies with larger sample sizes, diverse populations and of longer duration are needed to further compare CBT with standard nutrition counselling in adults and adolescents.

The Families Defeating Diabetes (FDD) study: documenting dietary choices of women with recent gestational diabetes at 3 and 12 months postpartum

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Objective: To document dietary choices of women with recent gestational diabetes (GDM) before and after participating in the Family Defeating Diabetes (FDD) intervention program. **Methods:** Eighty-nine women participated in the FDD intervention, which aimed to translate type 2 diabetes (T2DM) prevention messages to women with recent GDM in the context of their family. FDD intervention included: T2DM prevention seminar at 3 months postpartum promoting high-fibre, low-fat dietary choices, weight management and daily activity; membership in a weekly walking group; twice monthly electronic hints; and access to a FDD website. Participants had a 24-hour dietary recall and body measurements at three and twelve months postpartum (pre- and post-intervention). **Results:** Preliminary results from 11 women aged 35.9±3.1 (mean±SD) residing in London (Ontario) who participated in FDD intervention were compiled. Their BMI was 32.8±3.4 and 31.9±3.9 kg/m² at 3 and 12 months respectively. Food recalls at 3 months postpartum indicated that the mean daily intake of grain products (4.7±3.4 servings) and meat and alternatives (2.6±1.2 servings) of women met Canada's Food Guide recommendations, while their intake of vegetables and fruits (6.2±3.0 servings) and milk and alternatives (1.8±1.3 servings) were below recommendations. Food recalls at 12 months postpartum showed a non-significant increase in mean consumption of milk and alternatives (3.1±2.3 servings), while women's consumption of vegetables and fruits (6.5±2.1 servings) and

grain products was similar (4.1±3.2 servings) post-intervention. **Implications and conclusions:** In addition to the preliminary results from those women for the London (Ontario) site, further dietary recall analyses for women from all three FDD study sites will be of interest to help determine how we can effectively translate T2DM prevention message to this at-risk population. *This project is supported by a BRIDGES grant from the International Diabetes Federation. BRIDGES, an International Diabetes Federation project, is supported by an educational grant from Lilly Diabetes.*

A description of the frequency and types of Subjective Global Assessment scores and Nutrition Care Process Terminology diagnoses used by acute care Fraser Health registered dietitians

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Objectives: Fraser Health (FH) registered dietitians (RDs) assess hospitalized patients for malnutrition using Subjective Global Assessment (SGA) and document nutrition problems using Nutrition Care Process Terminology (NCPT) diagnoses. The purpose of this study was to describe the frequency of use of SGA categories and nutrition diagnoses (particularly highlighting malnutrition) for each SGA category. **Methods:** A retrospective chart review was conducted on initial nutrition electronic documentation written by FH RDs between August 16, 2014 and September 30, 2014. Documentation template type, hospital type (tertiary or community), presence of SGA score and the subsequent SGA category (very mild malnutrition to well-nourished, mild to moderate malnutrition, and severe malnutrition), and nutrition diagnoses were analyzed. **Results:** Of the RD electronic documents analyzed (N=932), 33.6% (n=313) had a SGA score indicating very mild malnutrition to well-nourished, 49.1% (n=458) had a SGA score indicating mild to moderate malnutrition, and 9.2% (n=86) had a SGA score indicating severe malnutrition. The remaining 8.1% (n=75) of electronic documents did not include a SGA score. Of the documented nutrition diagnoses (n=942), the most frequently used were inadequate oral intake (27.5%, n=259), inadequate protein-energy intake (19.7%, n=186), and malnutrition (10.7%, n=101). A non-NCPT diagnosis was used 10.7% of the time (n=101). For electronic documents indicating mild to moderate or severe malnutrition, 17.7% (n=96) used the NCPT diagnosis of malnutrition. Of the electronic documents with a SGA score indicating mild malnutrition to well-nourished (n=313), none included a diagnosis of malnutrition. **Implications & Conclusions:** The majority of FH RD electronic documents included a SGA score and used a NCPT diagnosis. Only a small proportion of electronic documents with a SGA indicating malnutrition included a diagnosis of malnutrition. The SGA data may inform key stakeholders regarding the nutritional status of hospitalized patients who have been assessed by FH RDs.

Exploring the use of social media tools by canadian dietitians working in cancer care

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Objectives: To explore the use of social media tools among dietitians providing clinical care to patients with cancer. **Methods:** An 11 question web-based survey was developed using FluidSurvey and was tested for face/content validity by five dietitians. It addressed demographic information, social media tools and devices used, reasons and frequencies of use; and personal opinions on the use of social media. Ethical approval was obtained from the UBC/BCCA Research Ethics Board. The survey was emailed through the DC Oncology Network and BC Oncology Community Partnership distribution lists (n=282). Potential participants were sent an invitation and had four weeks to respond. A reminder was sent after two weeks. Data collected from the surveys were analyzed using SPSS 21.0 for frequencies. **Results:** There were 81 respondents. Majority were from British Columbia (n=58, 72%), worked in an urban setting (n=69, 85%) and had 10+ years of experience (n=69, 85%). Areas of practice included outpatient, acute care, research, management/administration, public health, residential care and pediatrics. Over two thirds of respondents use social media tools with the top three as Youtube (25%), EatTracker (21%) and blogs (19%). 80% access social media using desktop or laptop computers. Respondents most frequently use social media tools to provide patients with information (30%), to research information (26%) and to keep updated on new treatments (25%). One third of respondents did not use any social media in their professional practice. The most prominent reasons are due to lack of knowledge on how to use (27%), hospital firewalls or policies (26%), and lack of time (20%). **Implications & Conclusions:** Our research indicates that the majority of dietitians incorporate social media tools in professional practice when educating cancer patients. Barriers such as accessibility, usage skills, and restrictive hospital policies should be explored to further enhance the use of social media in practice.

Lait et substituts : les enfants d'âge scolaire vivant en situation minoritaire à Ottawa en consomment-ils suffisamment?

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Objectif: L'objectif de cette étude est d'évaluer la consommation de lait et substituts chez des enfants âgés de 6 à 12 ans vivant à Ottawa et ayant une mère originaire d'Afrique Subsaharienne ou des Caraïbes ou une mère née au Canada. **Méthodologie:** Pour ce faire, 150 dyades mères-enfants ont été rencontrées par une diététiste entre janvier et juillet 2014. Un rappel de 24 heures a permis d'évaluer le nombre de portions de lait et substituts consommées par les enfants au cours de la journée précédente. Ce nombre a ensuite été comparé à la

recommandation du Guide alimentaire canadien (GAC) selon leur âge et leur sexe. **Résultats:** Parmi les 150 mères, 91 étaient originaires d'Afrique subsaharienne, 40 des Caraïbes et 19 du Canada. Les résultats préliminaires démontrent que, nonobstant la catégorie d'âge, la consommation quotidienne de lait et substituts des enfants était insuffisante, s'élevant en moyenne à seulement 1,7 portion. En effet, la plupart des enfants (78%) n'atteignaient pas la recommandation du GAC pour ce groupe alimentaire. Plus spécifiquement, la proportion d'enfants atteignant la recommandation du GAC était plus faible pour le groupe d'âge de 9 à 12 ans pour qui la recommandation est de 3 à 4 portions par jour (10 %) que le groupe d'âge de 6 à 8 ans pour qui la recommandation est de 2 portions de lait et substituts par jour (33 %). **Implications et conclusions:** Ces résultats préliminaires indiquent qu'il est possible que plusieurs de ces enfants d'âge scolaire ne consomment pas suffisamment de lait et substituts pour assurer une santé osseuse optimale. L'aspect exploratoire de la recherche pourrait permettre de mettre en lumière de nouvelles pistes de recherche guidant d'éventuels programmes et politiques en faveur de la santé de cette population. Financement : Consortium national de formation en santé (CNFS) – volet Université d'Ottawa.

La consommation de légumes et fruits chez les enfants en situation minoritaire à Ottawa : résultats préliminaires

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Objectif: Cette étude vise à déterminer si les enfants immigrants, non-immigrants, francophones et anglophones de la région d'Ottawa atteignent les recommandations de consommation de légumes et fruits selon *Bien manger avec le Guide alimentaire canadien* (GAC). **Méthodologie:** Nous avons recruté 158 mères nées en Afrique subsaharienne, dans les Caraïbes (francophones et anglophones) ou au Canada (francophones seulement) de janvier à juillet 2014. Un rappel de 24 heures a été fait lors d'entrevues nutritionnelles avec ces dernières et un de leurs enfants âgés de 6 à 12 ans. Le nombre de portions de légumes et fruits consommées a ensuite été compté et comparé à la recommandation du GAC. **Résultats:** Ces enfants ont consommé en moyenne 3,9 portions de légumes et fruits par jour, soit 1,7 portion de légumes, 1,2 portion de fruits et 1,1 portion de jus de légumes ou fruits. Moins d'un quart de ces enfants (23%) ont atteint la recommandation de légumes et fruits du GAC qui est de 5 ou 6 portions par jour selon l'âge de l'enfant. Il est à noter que 23% des enfants immigrants ont atteint les recommandations comparativement à 29% des non-immigrants, et 24% des francophones comparativement à 20% des anglophones. **Implications et conclusions:** Davantage de recherche devra être faite pour explorer les déterminants de la faible consommation de légumes et fruits observée chez ces enfants en situation minoritaire. Ces résultats préliminaires soulèvent, entre autres, le besoin d'éducation pour aider ces enfants à comprendre l'importance des légumes et fruits pour leur santé présente et future. En effet, selon le GAC, les légumes et fruits constituent le groupe alimentaire duquel il faut manger le plus de portions par journée, peu importe l'âge et le sexe. Projet financé par le Consortium national de formation en santé – volet Université d'Ottawa.

Do technological weight loss interventions have a greater impact on weight loss than non-technological weight loss interventions in overweight adults?

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OBJECTIVE: To contribute to the Practice-Based Evidence in Nutrition (PEN[®] Healthy Weight/Obesity Knowledge Pathway). The practice question explores the role of technology in interventions facilitating weight loss among overweight adults. **METHODS:** A literature search using keywords: obesity, obese, overweight, dietetics, nutrition, telehealth, telemonitoring, mobile device, mobile phone, portable computers, web application, mobile application, personal digital assistants, hand held computers, computer based, and technology, yielded four systematic reviews, one meta-analysis, two cohort trials, two qualitative studies and four randomized controlled trials. The technological interventions reviewed were grouped into: computer-based, mobile device based and application based (apps). The impact of technology on self-monitoring was also examined. PEN[®] Evidence-based process and writing guidelines were followed for critiquing and grading the literature, and formulating Evidence Statements and Key Practice Points. **RESULTS:** Strong evidence for short-term (9-24 weeks), and moderate evidence for medium-term (24- 52 weeks) weight loss with mobile technology was noted. Receiving tailored feedback from self-monitoring with technology resulted in greater weight loss compared to no intervention. The literature was inconclusive with regards to the impact of technology on adherence of self-monitoring and if self-monitoring with technology achieved greater weight loss over traditional forms of self-monitoring. There is strong evidence for significant short (10-14 weeks) and medium-term (24-52 weeks) weight loss with computer-based interventions, and questionable evidence for weight loss in long-term (52+ weeks) interventions. Moderate evidence suggests the addition of tailored feedback increases weight loss effect. App-based interventions show potential for modest weight loss in the short (8-12 weeks) and medium-term (24 weeks). **IMPLICATIONS/CONCLUSION:** Adherence to interventions declines with time, as does weight loss effects. Components that have contributed to successful interventions include: goal setting, self-monitoring and tailored feedback. More research exploring the implications of technology-based weight loss interventions on diverse populations, and over longer-term periods are needed.

Facilitators and barriers to implementation of the Baby Friendly Initiative with community health centre administrative staff in the Sea to Sky Corridor

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Objectives: To identify potential facilitators and barriers to the implementation of the Baby Friendly Initiative (BFI) with community health centre administrative staff in the Sea to Sky

Corridor. **Methods:** Five semi-structured interviews were conducted with administrative staff at the Sea to Sky Corridor community health centres. Data was transcribed by co-investigators and a transcriptionist, and was analyzed using iterative thematic analysis. **Results:** Five major themes emerged, each with multiple sub-themes. These themes included: Participant Knowledge, Perceived Personal and Community Support for Breastfeeding, Physical Facility Influences, Availability of Resources, and Comfort with Breastfeeding. **Implications & Conclusions:** Investigators perceive that support for breastfeeding, according to the standards of the BFI, is currently incomplete. Participants express a profound support for breastfeeding; however perceive that there are gaps in some key aspects of this support. Participants express a preference for modesty, or privacy, when breastfeeding in public, and discomfort with breastfeeding older infants and toddlers, which counter key BFI messages. Participants were likely to draw upon their own experiences with breastfeeding, making positive experiences potential facilitators, while negative experiences or lack of experience were perceived as barriers. Within facilities, breastfeeding promotional materials are present, but spatial constraints pose significant barriers. Available resources, including mandatory training for all staff, also appear only partially implemented at this time. These findings identify important facilitators that are in place, as well as potential barriers, which can be used by the VCH BFI implementation committee to identify areas to address to work toward BFI implementation in the Sea to Sky Corridor.

Motivational interviewing versus regular primary care treatment for clinical outcomes related to dietary modifications for adults with coronary heart disease in secondary cardiac prevention

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Objectives: To contribute to the Practice-Based Evidence in Nutrition (PEN[®]) Professional Practice 'Counselling Strategies' Pathway. The practice question examined the use of motivational interviewing (MI) versus standard primary care treatment (control group) to improve nutritionally related health outcomes in adults with coronary heart disease (CHD) in secondary cardiac prevention. **Methods:** A literature search was conducted with combinations of the keywords: motivational interview, diet, nutrition, eating, food, cardiac, heart, myocardial infarction, and CHD. The review included studies published between 2004-2014 aimed at secondary cardiac prevention that included both a nutrition education component and MI sessions. Two randomized controlled trials (RCTs) with a combined 1049 subjects, each with a separately published follow-up extending over one year, were evaluated and graded to provide Key Practice Points and Evidence Statements according to the PEN[®] evidence-based process and writing guidelines. **Results:** Although both studies noted improvement in total and LDL cholesterol levels, there was no significant difference between the MI and control group. One study's 12 month follow-up showed a statistically significant higher dropout rate (29% vs 12.3%, $p=0.014$) in the MI group versus the control group. In the same RCT, the MI group had significant improvement (3.7 vs 4.1, $p=0.04$) versus the control group in exercise capacity, measured by metabolic equivalent of task. **Implications & Conclusions:** Current literature does not demonstrate a significant benefit from MI over regular primary care treatment with respect to modifying dietary habits of adults with CHD. Details were limited in both studies of MI training completed by counsellors and time spent focusing on dietary interventions during MI

sessions. Published studies focusing on dietary habits using an RD to administer MI in secondary cardiac prevention are limited. Future studies are required to expand understanding of the effectiveness of MI counselling techniques for adults with CHD in secondary cardiac prevention.

Determining the best practices and strategies to reduce the consumption of highly processed foods in adults aged 18 to 64: A review of the grey literature

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Almost two-thirds (61.7%) of the Canadian diet contains highly processed foods. Over consumption of these foods, combined with intake patterns that fall below recommended nutrient levels may lead to increased energy intake and risk of developing chronic disease. A grey literature review was conducted as part of a more comprehensive situational assessment that will inform program planning and service delivery at Simcoe Muskoka District Health Unit (SMDHU). **Objective:** To determine best practices and strategies to reduce consumption of highly processed foods in adults aged 18 to 64. **Methods:** With the assistance of the SMDHU librarian, 11 sources were searched from November 2014 to January 2015. Sources were Public Health Ontario, Canadian Best Practices Portal, Health Evidence, Google Search, Google Scholar, Canadian Public Health Information, Public Health Agency of Canada, Canadian Public Health Association, Theses Canada, Ontario Society of Nutrition Professionals in Public Health OSNPPH listserve and PEN[®]. Relevance was evaluated using the TEIP Program Evidence Tool; collected data was sorted and documented using the TEIP Evidence Collection Spreadsheet with key findings organized and analyzed according to the Ottawa Charter Strategies. **Results:** Five articles met the inclusion criteria and were reviewed. Articles reviewed described community based healthy eating programs that aimed to improve consumption and access to vegetables and fruit. No articles described programs that measured consumption of highly processed foods. Three articles showed an increase in consumption, and two in access, of vegetables and fruit may result in decreased consumption of highly processed foods. All community programs reviewed utilized multiple health promotion strategies to achieve program goals. **Conclusion:** There is a lack of evidence on the topic. Community based programs that include multiple health promotion strategies to improve access and consumption of vegetables and fruit are considered promising practices to reduce consumption of highly processed foods in adults 18-64.

Caregiver feeding practices, nutrition knowledge and early dental caries risk in young Aboriginal children: A review of the literature

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Objectives: Early dental caries (EDC) are preventable, yet over 85% of Canadian Aboriginal and Inuit preschoolers, aged 3 to 5 have caries. Oral health education should include culturally appropriate parent feeding and nutrition advice yet there is limited knowledge. A review of the

international literature on key nutrition determinants and EDC risk in young Indigenous children (0-6 years) will inform evidence-based nutrition practice guidelines. **Methods:** In December 2014, a search for English publications from 2009-2014 was conducted in Cochrane, CINAHL, Medline, PMC and Pubmed databases. Key search terms included dental caries, Aboriginal, Indigenous, First Nations, Indian, Inuit, Métis, preschool and child. Using Practice-based Evidence in Nutrition (PEN[®]) processes and tools, articles were screened, appraised, graded and summarized into practice recommendations. **Results:** Of the 395 articles retrieved; 66 were relevant based on titles with 25 abstracts meeting the inclusion criteria. From the 25 articles, five were selected and an additional three were included from a hand search of the references. Eight Canadian articles were appraised with an overall C grade of evidence. Protective factors included prenatal vitamin D supplementation (600 IU/day) and children's milk intake. Nocturnal and naptime bottle-feeding and sugar sweetened beverage consumption were risk factors. **Implications & Conclusions:** There is limited, low grade evidence and more research is needed internationally. PEN[®] practice guidelines will be developed with an expert review committee of Canadian and Australian nutrition, medical and dental practitioners working with paediatric and Indigenous populations. Healthcare practitioners need to work with Aboriginal Elders using a holistic approach in order to engage caregivers and improve nutrition and oral health practices. To reduce the incidence of EDC and improve nutritional status, a preventative strategy which includes screening along with restorative action would be more cost effective and provide a better long-term outcome for overall health in Aboriginal populations across Canada.

Is the use of self-monitoring an effective strategy for facilitating weight loss in obese adults?

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Objective: To provide an evidence-based answer to the following question for the 'Healthy Weights/Obesity' Knowledge Pathway in the Practice-based Evidence in Nutrition[®](PEN) international nutrition database. Question: Is the use of self-monitoring an effective strategy for facilitating weight loss in obese adults? **Methods:** A literature search (1946-2014) was conducted with combinations of keywords: self-care, self-monitor, record, diet, eating behaviour, body weight, weight loss, obesity, and overweight. Articles included as evidence focused on self-monitoring strategies and weight loss and were all published within the last six years (2008-2014). Four randomized control trials, two prospective cohort studies, two systematic reviews, and three qualitative studies were evaluated and graded to provide Key Practice Points and Evidence Statements according to PEN[®] evidence-based process and writing guidelines. **Results:** Five studies (n=10406) indicate that high frequency and consistency of self-monitoring dietary intake is associated with greater weight loss. One study (n=40) indicates that self-monitoring dietary intake, paired with increased water consumption, is associated with greater weight loss. One randomized control trial (n=183) found that daily self-weighing had no effect on weight loss; whereas, a systematic review (n=16434) reported significant weight loss associated with daily or weekly self-weighing. Three qualitative studies (n=105) show that social support is commonly associated with increased adherence to self-monitoring activities. **Implications and Conclusions:** Expert opinion and recent evidence suggests that adhering to frequent and consistent self-monitoring activities by recording dietary intake, body weight, and activity levels could significantly contribute to obesity management and weight loss

in obese adults. Limitations are the recommended duration and frequency of self-monitoring is unspecified, the amount of weight loss varied among studies, and these results are not generalizable due to the inclusion of predominantly Caucasian females. Future studies should include both male participants and participants of various ethnicities in order to increase generalizability of the findings.

A Literature Review: Collection of Food-Related Themes and Experiences of the Spanish Residential School

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In an effort to educate, Christianize and colonize Aboriginal children, the Spanish Residential School, located west of Sudbury, was the largest school in Ontario and operated from 1913-1965. Dietary habits and food socialization, in particular, have largely impacted the behaviours, attitudes, and relationships with food today for survivors and younger generations. Noojmowin Teg Health Centre registered dietitians have observed food-related challenges associated with the Spanish Residential School environment among survivors residing on Manitoulin Island, ON. **OBJECTIVE:** To identify and analyze food and nutrition related experiences at Spanish Residential School. **METHODS:** From December 2014 to April 2015, with the guidance of an archivist, a review of Spanish Residential School archival material was conducted using the Algoma University Shingwauk Residential Schools Centre's electronically transcribed archival material. Inclusion/exclusion criterion and key words included mealtime environment, food, Spanish Residential School, colonization, kitchen, service, food preparation, and 1913-1965. Data sources were newspaper clippings, newsletters, supply records, medical accounts, federal Indian Affairs Annual Reports as well as academic and personal accounts. Data was entered and analyzed where key themes were generated using the Toward Evidence-Informed Practice (TEIP) evidence tool. **RESULTS:** Three major themes were identified: i) food as a reward and/or punishment, ii) mealtime environment, and iii) food quantity and quality. Daily food items/menus were identified to suggest possible food triggers. Discrepancies were identified between survivor biographies and academic accounts. **IMPLICATIONS:** This literature review will increase awareness among registered dietitians and health care professionals working with Spanish School survivors and their families. There is a need to improve future practices through cultural training and sensitivity workshops regarding counselling strategies for practitioners. Registered dietitians should be prepared to identify emotional triggers and appropriately counsel clients who have experienced significant traumas including residential school survivors.

Exploring pre-internship students' perceptions of an integrated dietetic internship – a pilot study

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Objectives: To gain understanding of 4th year students' lived experiences while enrolled in an integrated dietetics program, and to explore students' perceptions about their upcoming internships. **Methods:** A phenomenological approach guided the methodology for this qualitative study. One informational interview and one focus group (n=6) were conducted with University of British Columbia Dietetics Major students. All students were in the academic year prior to internship. The informational interview was used to pilot test the focus group script. Thematic analysis of the verified focus group transcript was conducted to identify underlying concepts. **Results:** The informational interview informed script adjustments for clarity. Four themes emerged from the focus group, which characterized the lived experiences of the students: mixed feelings (e.g. excitement, drive to succeed, anxiety, fear), uncertainty regarding the future, readiness for change, and self-identified unmet learning needs. Program structure, including curriculum and relationships with faculty and peers, also impacted students' experiences. **Implications & Conclusions:** The lived experiences of dietetics students and their perceptions about their upcoming internships are influenced by diverse factors, including experiences within and outside of the program. Recognition of these influences can inform program changes to enhance student support in their preparation for internship. Future focus groups are recommended to obtain data saturation.

Intuitive eating as a non-dieting approach and its effectiveness in weight management counselling

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Objectives: To provide evidence-based answers to the following question for the Professional Practice knowledge pathway in the Practice-based Evidence in Nutrition[®] (PEN) database used by dietetic professionals in Canada, United Kingdom, Australia, and New Zealand. Question: How does intuitive eating (IE) as a non-dieting approach in nutrition counselling compare to traditional diet approaches (restrictive eating-RE) in affecting health outcomes of adults. **Methods:** Following PEN research guidelines, a systematic literature review was conducted for articles that compared IE to a more traditional dieting approach (RE) and evaluated health outcomes, including weight management, adaptive eating behaviours and overall well-being. Studies were included that were published within the last nine years (2004-present), involved adults (>19yrs), and identified IE as an intervention or observed practice. **Results:** To date, there are limited randomized control trials and systematic literature reviews. Observational studies suggest an association between using non dieting approaches in weight management counselling and psycho-social health outcomes, such as self-efficacy, perceived body image and adaptive eating behaviours (IE principles, hunger and satiety cues). Some evidence suggests that incorporating non dieting approaches into weight management

encourages individuals to let go of dieting practices, resulting in the adoption of long-term healthy lifestyle changes, irrespective of weight changes. **Implications and conclusions:** Traditionally weight management was thought to be most effectively based on RE, however; recently a shift is occurring to the exploration of more non-dieting approaches (IE). Although there is no causal evidence between IE and weight management, there is fair evidence suggesting an association between the incorporation of IE principles and psychosocial health outcomes including, but not limited to, weight.

Is mindful eating therapy effective in facilitating weight loss and reducing frequency of overeating behaviours in adults

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Objective: To add to the Mindful Eating Knowledge Pathway in the Practice-based Evidence in Nutrition® (PEN) database with evidence-based answers to the following question: Is mindful eating therapy effective in facilitating weight loss and reducing frequency of overeating behaviours in adults? **Methods:** A literature search was conducted in various databases including PubMed, MEDLINE, OvidSP, Trip, Cochrane Library, and EMBASE with combinations of keywords; mindful eating, mindfulness, mind-body therapy, weight, diet adherence, obesity, diabetes, and food intake. Articles were filtered for studies published from 2011 to 2015. Often mindful eating was included in conjunction with, or as a component of a program/therapy, and seldom used on its own as an intervention. Therefore, studies were included if they maintained a focus on mindfulness and its impact on food intake or other nutrition-related outcomes. Three systematic literature reviews, five randomized control trials, and one large prospective pilot study were identified. Using the PEN® evidence-based process and writer's guidelines the articles were critiqued and graded to provide Key Practice Points and Evidence Statements to answer the question. **Results:** Substantial evidence based on two systematic reviews supports an association between mindful eating therapy and improvements in binge-eating behaviours in adult women. A decrease in frequency and severity of binges was observed in the majority of studies. The literature on the effect of mindful eating therapy on glycemic control, weight loss, and emotional eating demonstrated mixed results and requires further research to determine validity and generalizability beyond a female Caucasian population. **Implications & Conclusions:** The literature supporting mindfulness-based therapies as effective interventions for overeating behaviours is increasing. However, there is currently limited evidence to support the impact of mindful eating on weight loss, and further studies with larger sample sizes, longer follow-up outcomes, representation of a more ethnic sample, and male populations are required.

Dietary calcium intake in postmenopausal women in Montreal, Quebec

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Objectives: Cross-sectional data from the Canadian Multicentre Osteoporosis Study (CaMos) in 2009 suggested that >50% of Canadians aged 50 years have a total calcium intake below the Estimated Average Requirement (EAR) of 1,000 mg/day. Following the 2011 revised Dietary Reference Intakes, we aimed to examine the dietary calcium intake adequacy in postmenopausal women. **Methods:** A validated 51-item food frequency questionnaire (FFQ) was administered to community-living postmenopausal women by a registered dietitian to assess dietary calcium intake over the preceding month. Logistic regression analyses were conducted to estimate the odds of meeting the EAR by independent continuous (age and BMI) and categorical variables (calcium supplementation, education level, tobacco use, and alcohol consumption). To determine whether dietary calcium intake varied by these covariates, multiple linear regression analyses were conducted. **Results:** One hundred and eleven postmenopausal women, 90% Caucasian, completed the FFQ (median age 62 y [IQR 57-69], median BMI 26 kg/m² [IQR 23-29]). Median dietary calcium intake was 715 mg/d (IQR 529-1030). Overall, 29% of dietary calcium came from fluid milk, 13% from yogurt and 20% from cheese. Calcium supplements were used by 59% of the participants (median dosage 500 mg/d [IQR 333-800]). Only 28% had an intake \geq 1,000 mg/day from foods, whereas 57% had a total intake from dietary and supplemental sources of calcium equal to or above the EAR. Each year of advancing age was associated with lower odds of meeting adequate dietary calcium intake in multivariate logistic regression analysis (OR 0.92 [95% CI 0.85-0.99, $p=0.04$]) after adjustment for BMI, calcium supplementation, education level and lifestyle variables. Linear regression analyses did not identify correlates of dietary calcium intake. **Implications & Conclusions:** Our findings confirm the high prevalence of inadequate calcium intake among postmenopausal women. Barriers and interventions to ensure adequate calcium intake from dietary sources should be further investigated.

How does motivational interviewing (MI) compared with standard nutrition counselling affect long term weight loss and/or eating behavior in overweight/obese adults?

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OBJECTIVE: To contribute to the Practice-Based Evidence in Nutrition (PEN®) Counselling Strategies Knowledge Pathway. The practice question examined use of MI as a counselling strategy to enhance weight loss or eating behavior change in overweight/obese adults. **METHODS:** A literature search of articles published after 2005, using keywords including motivational interviewing, overweight, obesity, nutrition therapy, nondirective therapy and food habits, yielded a systematic review of randomized controlled trials, cluster randomized control study, observational study, and summary of evidence. All studies that evaluated the impact of MI on weight loss or eating behavior outcomes in the target population were included. PEN® evidence-based process and writer's guidelines were followed for searching, critiquing literature, grading evidence, and formulating evidence statements and key practice points. **RESULTS:** A systematic review of 11 studies (n=1448) concluded that MI appears to enhance weight loss in obese/overweight adults with the exception of inconsistent results with African American women in one study. Standard mean deviation for the effect of MI on mean body mass was 0.51 (95% CI -1.04, 0.01; $P = 0.053$). The cluster randomized control study (n=327) also suggested MI may be an effective long-term strategy for weight loss in obese/overweight Iranian women. The observational study (n=461) concluded that using counselling techniques consistent with MI principles may improve weight-related attitudes and

behaviors, while the summary of evidence established that delivering MI in addition to a behavioral weight loss program may enhance weight loss. **IMPLICATIONS/CONCLUSION:** MI appears to enhance weight loss among overweight/obese adult populations. In order to draw firm conclusions, more long-term, large scale randomized controlled trials in obese/overweight adult populations is recommended. Given the novelty of MI application to behavioral weight management, some issues merit further investigation including; type and extent of provider training required, cost effectiveness, and examining the feasibility and effectiveness of MI strategies.

A description on meal scheduling in relation to sleep disturbances in individuals living in residential care

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Objectives: To explore any possible association between the timing of the main meal, defined as the largest hot meal of the day, and sleep disturbances, in residents living in residential care facilities in Interior Health (IH). **Methods:** A retrospective chart review was completed on inactive charts from two residential care sites in Kamloops and two in Penticton. Two facilities serve lunch as their main meal and two serve dinner as their main meal. A six-month time period was reviewed, and the number of night-time falls, night-time awakenings, and scheduled and as needed (PRN) sleep aids given was noted. Data was analyzed using descriptive statistics and T-Tests/Chi-squared test in SPSS. **Results:** 114 inactive charts were reviewed. No statistical significant difference was found for the amount of sleep disturbances (PRN sleep aid use, falls, awakenings) when comparing sites with the main meal as lunch or dinner ($p = 0.991, 0.329, 0.280$ respectively). A statistically significant association was found for the amount of PRN sleep aids used in residents diagnosed with dementia compared to residents who were not diagnosed with dementia ($p = 0.00$). **Implications & Conclusions:** Our study was limited by lack of statistical power due to small sample size and many confounding factors, thus we are unable to make specific recommendations in relation to the possible association of meal scheduling and sleep disturbances. More research is warranted in this area; however, managers and Food Services should focus on implementing dining practices that promote a healthy eating environment for all residents.

Exploring the nutritional adequacy, food security, and food safety issues of community-dwelling people living with dementia

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Purpose: The purpose of this project was to conduct a review on the state of knowledge on the nutritional adequacy, food security, and food safety issues of people living with dementia in their homes to inform research grant applications. **Process of Content:** A literature review was conducted to learn about the nutritional adequacy, food security, and food safety issues for this

population. Analysis involved comparison of issues presented in the literature to SS's observations of these issues based on volunteering as a meal assistant with seniors living with dementia. **Project Summary:** The extant literature contained descriptions of the physical aspects of the nutritional issues faced by people living with dementia including loss of appetite, difficulty swallowing, and weight loss, and family experiences of mealtimes including forgetting to eat, elongated time to consume a meal, 'acting out', and frustration. Although not related to dementia, one article was located on seniors and food safety. Issues were not located related to food access/food security for people living with dementia in a home setting. Through volunteer experiences with seniors, to prevent and slow the progress of malnutrition within this population there should be more focus on nutritional issues such as nutritional adequacy, food security, and food safety faced by people living with dementia. **Recommendations & Conclusions:** The extant literature was lacking in information related to the food access and food safety revealing opportunities of further research. The results of this project are useful to inform grant applications to address the gaps in understanding common issues of affecting seniors with dementia.

Use of a travelling cart for nutrition month education: Engaging hard to reach staff in a hospital setting

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Objective: To reach groups within the hospital who normally do not have the opportunity to participate in nutrition month activities. Traditionally dietetic interns provided nutrition month education to staff by setting up a booth for one week in the main thoroughfare of the hospital. While information was widely accessed by 9-5'ers, it was suspected that many staff were not being reached. In an attempt to better engage staff, a new format of education was trialed – a travelling education cart. **Methods:** A scan of the literature was performed to determine if this type of education had been done before. One abstract was identified. Using this abstract and the already established practice at GRH of providing a "travelling flu clinic", a list of criteria was developed for the cart including sufficient storage for: educational resources, recipes, display board, snacks and games. Two mobile carts were used. The carts were taken to most units in the hospital and stationed for an hour in the nearest staff lounge where education, games and snacks could be provided in a way that would be least disruptive to the unit and also adhere to existing infection control policies. **Results:** One hundred and sixty-one evaluations were completed. 98% of staff indicated they were satisfied/strongly satisfied with nutrition month activities. Although not quantified, many staff indicated that they had never been to a nutrition month event before due to heavy workload. The most valued part of the travelling cart were: recipes, activities and interacting with dietetic interns. **Implications & Conclusions:** By using a travelling cart to provide nutrition month education, interns were able to engage staff members who otherwise may not have been able to access nutrition information. The travelling cart model should be considered as an effective way for reaching staff in a hospital environment.

“FRESH at Oakridge? I’d be down for that”: A qualitative focus group study

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Post-secondary students have been shown to have poor dietary intake, the same appears to be true for secondary school students. FRESH, Food Resources and Education for Student Health, is a multi-strategy peer nutrition education program created by and for students at Western University under the supervision of faculty advisors and foodservice managers. Through the Ontario Ministry of Education *Healthy Eating in Secondary Schools* grant, FRESH was implemented at Oakridge Secondary School in London, Ontario. **Objectives:** The objective of this formative evaluation was to assess the transferability of the FRESH program prior to implementing it at Oakridge S.S. **Methods:** This study used a qualitative research approach in the form of focus group sessions using a semi-structured interview guide. Data was analyzed using a-priori codes from the interview guide as a starting point. Content analysis was used to sort the data into broad themes and then into sub-categories. **Results:** Twenty-nine students (n=29) aged 14-16 participated in three one-hour focus groups. One-third of participants were 16 years of age, and three-quarters were female. Students suggested the use of social media and school resources such as “Oak radio” and twitter account to increase awareness and use of FRESH promo material such as t-shirts, bracelets, stickers and water bottles for advertisement. In particular, students wanted to see cooking classes, interactive booths, and ‘celebrity chef’ events in the auditorium. Furthermore, students wanted programs that were unique and “trendy” and made comments regarding popularity of programs being dependent on peer influence. **Implications and Conclusions:** Every participant agreed that the program would be successful and would have a positive impact. Students with cooking skills have been shown to have improved food selection and meet nutrition guidelines. Therefore, it is important to target teenagers to instill the value of healthy eating and cooking skills before they transition into independent living.

Nutrition Care Process Terminology in Northern Health: Dietitian use, knowledge, attitudes and learning needs

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Objectives: To determine the status of Nutrition Care Process Terminology (NCPT) implementation in hospitals and long-term care (LTC) facilities in Northern Health (NH), and to identify knowledge, attitudes, and education needs around NCPT for registered dietitians (RD) in NH. **Methods:** An electronic cross-sectional survey adapted from an existing Dietitians of Canada survey was distributed to all RDs employed at NH hospitals and LTC facilities in clinical roles using FluidSurveys™. Descriptive statistics (frequencies) were generated using SPSS®. **Results:** The majority (67%) of RDs are using NCPT language in any capacity in documentation. The majority of RDs (73%) have implemented nutrition diagnosis language,

47% have implemented nutrition assessment language, 27% have implemented nutrition intervention language and 20% have implemented nutrition monitoring and evaluation language. The most important factors reported to have helped implement NCPT language over the four components were use of the *Pocket Guide for IDNT Reference Manual*, prior education, and support from colleagues. The most frequently reported barriers for NCPT language implementation were a lack of education, resources and time across all four components of NCPT. Eighty percent of respondents agreed that implementing the NCPT within their practice was important. RDs reported to benefit the most from additional training in the forms of in-person workshops (67%), mentorship (53%) and printed resources (53%). **Implications & Conclusions:** NCPT use is important for documentation and communication of RD practice. While nutrition diagnosis language is used most frequently by NH RDs, opportunities exist to further implement NCPT language. The results of this study can help inform additional training needs around NCPT use to help support NH RDs.

Sensory evaluation of dough formulated with lentil powder: The role of added sugar

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Objective: The food formulation using the ingredients capable of decreasing the postprandial glycaemia and the reduction of added sugar content presents the feasible strategies in the development of functional foods aimed at blood glucose control. The objective was to evaluate the perceived intensity of the sweetness in baked dough samples formulated with high content of pulse powder and various levels of added sugar and find the relationship between their perceived sweetness, taste and pleasantness. **Methods:** Five baked dough samples were formulated with a mixture of lentils powder and whole wheat flour with 6, 8, 12, 18 and 24% of sugar content, respectively. Two highest concentrations represent the level of sugar in commercially available snack bars. Samples were blinded and randomly assigned to 28 participants (37.0±13.7 y, 26 female, 2 male). The intensity of sweetness and pleasantness were measured with 100 mm visual analogue scale (VAS) and the taste was assessed with hedonic 9-point scale. **Results:** There was an effect of treatment on perceived sweetness ($P<0.0001$). The participants discriminated between 6 and 18% while the threshold for the sweetness detection was 18% and there was no difference between the samples with 18 and 24% of added sugar. The increase of sugar content was associated with increased taste ($r=0.63$, $P<0.0001$) and perceived pleasantness ($r=0.76$, $P<0.0001$). There was an effect of treatment on perceived taste ($P<0.0001$) and pleasantness ($P<0.0001$). The taste and pleasantness linearly increased with the increased sugar content (6-18%) while the increase beyond 18% did not result in improved taste and pleasantness. **Implications and Conclusion:** The increase of sugar content improves the sensory characteristics of the dough formulated with lentil and whole wheat flour however the increase of sugar beyond the detection threshold does not improve the taste and pleasantness of the product but rather contributes to increased glycaemia and energy intake.

Ontario Bariatric Network vitamin and mineral supplementation recommendations pre and post gastric surgery (Roux-en-Y and sleeve gastrectomy)

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Clinical practice guidelines exist to guide health care practitioners in the pre and post-operative care of bariatric patients, however it is not known if these guidelines are being followed in clinical practice. The guideline used for comparison was *Clinical Practice Guidelines for the perioperative nutritional, metabolic, and Nonsurgical Support of the Bariatric Surgery Patient (2013)* co-sponsored by American Association of Clinical Endocrinologists, The Obesity Society, and the American Society for Metabolic & Bariatric Surgery. **Objective:** To investigate the vitamin and mineral recommendations being made during the pre-surgery, OPTIFAST™, and post surgery phase at all Ontario Bariatric Network (OBN) sites. **Methods:** A 48-item online survey (Fluid Surveys®) was sent to all OBN sites (n=12) in April 2015 with one survey to be completed per site. REB approval was granted from Thunder Bay Regional Health Sciences Centre, Health Sciences North and Lakehead University. The results were compiled and analyzed using Microsoft Excel®. **Results:** A total of seven OBN sites participated in the survey (78% response rate). Three sites were excluded because they are only surgical sites. Vitamin and/or mineral supplements were recommended as standard practice at four of the seven sites pre-surgery and all of the sites post-surgery. One of the seven sites met the clinical practice guideline post-surgery for total iron, five of seven for calcium, six of seven for vitamin D and vitamin B12. Six of seven sites reported consensus between health care practitioners at their site for vitamin and mineral recommendations post-surgery. **Implications and Conclusion:** Dietitians within the OBN are fairly consistent in their recommendations for vitamin D, calcium and vitamin B12. Inconsistencies exist for the total amount of iron and the type and amount of multivitamin/mineral supplements recommended. Further study is needed to determine the rationale leading to the variations in practice.

A description of nutrition diagnosis statements written by registered dietitians in residential care at Holy Family Hospital, Providence Health Care

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Objectives. The purpose of this study was to assess the type and frequency of Nutrition Diagnosis statements written by registered dietitians in the Extended Care Unit at Holy Family Hospital. By enhancing understanding of the types and prevalence of nutrition problems encountered in residential care, future steps can be taken to ensure that dietitian resources are allocated and utilized effectively. **Methods.** A retrospective chart review of residents who were

both admitted and discharged or deceased between January 1st, 2011 and October 31st, 2014 was conducted. Basic demographics were collected and frequencies of the Problem statements were calculated. Etiologies related to the most frequent Problems were identified. **Results.** A total of 122 residents met the inclusion criteria. Overall, “Inadequate oral intake” was the most frequent Problem (36.4%), followed by “No nutrition diagnosis” (18.7%). The most common Etiologies leading to the nutrition diagnosis of inadequate oral intake were “decreased ability to consume adequate energy” (56.4%) and psychological causes (19.8%). **Implications & Conclusions.** Dietitian interventions must be tailored to the etiologies leading to the nutrition diagnosis in order to treat the nutrition diagnosis. Continuing education on the nutrition care process and on updates to diagnostic terminology released by the ADA will encourage dietitians to consider the etiologies and assist in the selection of the most appropriate nutrition diagnosis. Educational opportunities can also be targeted at enhancing interventions for the most prevalent nutrition problems, thus increasing dietitians’ confidence and ability to intervene and treat these problems.

A Description of Nutrition Diagnosis Statements Written by Registered Dietitians in General Medicine Units at Providence Health Care

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Objective: Nutrition diagnosis statements (PES statements) are written by Registered Dietitians at Providence Health Care (PHC) as part of the Nutrition Care Process (NCP). The terminologies used to construct PES statements are outlined by the *International Dietetics Nutrition Terminology (IDNT) Reference Manual*. This study examined the frequency of *problem (P)*, *etiology (E)*, *signs and symptoms (S)* statements, and the reason for admission to help better understand the clinical cases seen in acute care hospitals by dietitians. **Methods:** A retrospective chart review was conducted on patient charts from the general medicine units at St Paul’s Hospital (SPH) and Mount Saint Joseph Hospital (MSJH). Nutrition assessment forms written between May 1-21, 2014 were included in this study. Patient demographics and PES statements were collected and categorized for analysis. **Results:** A total of 103 patient charts were included in the final sample size. PES statements were written in every nutrition assessment form reviewed. *Problems* from the *intake* domain were the most common (59.2%), with “inadequate oral intake” being the most frequently occurring *problem* at both sites (33.9%). *Etiologies* were categorized most often under *physiologic-metabolic* (58.2%), *treatment* (11.2%), and *physical function* (8.2%) domains. Approximately half of *signs and symptoms* belonged to the *diet/food/nutrition-related history* (51.0%) domain while 10% of the total *signs and symptoms* did not fit the assigned categories. **Implications and Conclusions:** PES statements collected within the sample were preferentially written using a small pool of *P*, *E*, and *S* domains. Thus, it is important to focus on providing education and allocating resources to address the most prominent *problems* and *etiologies*. This can help enhance the use of standardized language and the development of effective nutrition care plans.

Comparison of measured energy expenditure with estimated energy expenditure in burn-injured patients

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Objectives: Determine which predictive equation(s) best estimate energy expenditure (EE) of mechanically ventilated, critically ill patients with $\geq 20\%$ total body surface area (TBSA) burns at Vancouver General Hospital (VGH) when EE cannot be measured using indirect calorimetry (IC). **Methods:** A retrospective chart review of 29 charts was conducted, with a total of ten patients meeting study criteria. Estimated EE was calculated for each patient using seven predictive equations: Harris-Benedict, Xie, Mifflin St. Jeor, Penn State, Ireton-Jones, Milner, and Zawacki. Summation of least error (SLE) was used to determine the variance of each equation from the IC measurement; the equation with the least variance is that which most closely approximates the measured EE, as determined by IC. Bias was used to indicate whether each equation tended to over or underestimate EE compared to IC measurements. Statistically significant differences between equation results were determined through 95% confidence intervals ($\alpha=0.05$). **Results:** The Zawacki equation produced the lowest SLE with statistically significant difference from all other equations, estimating EE within 11.5% of the measured EE, on average. Upon stratified analysis, the Zawacki equation produced the lowest SLE with statistically significant difference from all other equations, estimating on average within -12.2%, +12.3%, +/-13.0%, -1.8%, and +15.2% of measured EE for each of the following patient categories, respectively: age 50-70 years, BMI >30 kg/m², TBSA burn of 20-39% and $>60\%$, and 4-8 days post-burn. **Implications & Conclusions:** The Zawacki equation appears to have the least error when estimating EE in mechanically ventilated, critically ill, burn-injured patients. When IC - the gold standard in measuring EE - is unavailable, using the Zawacki equation may improve nutritional management in this severely hypermetabolic population.

Maternal intake of saturated fats, folate and iron increases the likelihood of reporting adverse infant cry and sleep outcomes at three months of age

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Rapid fetal brain development occurs at the third trimester of pregnancy and maternal intake of a number of nutrients is associated with infant outcomes. Sleep and crying behaviours in infancy are early indicators of self-regulation and have been associated with later risk of obesity.

Objective: To investigate the relationship of maternal intake of saturated fat, folate, vitamin B12, iron and docosahexaenoic acid (DHA) to infant sleep and crying behaviours at three months of age. **Methods:** Using women (n=888) in the Alberta Pregnancy Outcomes and Nutrition study, dietary intake was estimated during the third trimester of pregnancy by a dietitian-administered 24-hour recall and supplement intake questionnaire. Total sleep and cry durations were estimated using parent-administered questionnaires. Associations were examined while controlling for co-variables such as energy intake, income, education level, pre-pregnancy BMI and smoking status. **Results:** Women with higher saturated fat intake had an increased likelihood of reporting infant crying in the highest quartile (OR=1.03, p=0.04). Estimated median (IQR) folate intake was 1.3mg (1.2-1.5) and women whose intakes fell in the highest tertile had an increased likelihood to report sleep duration falling in the lowest quartile (OR=0.50, p=0.03). The estimated median (IQR) iron intake was 42.5mg (35.6-52.7). There was an increased likelihood of mothers reporting excessive infant crying by women with iron intakes above the EAR (OR=0.22, p=0.04). There were no significant relationships between sleep or crying and intake of vitamin B12 (median 10.2mcg, IQR 6.2-16.2) or DHA (median 30.3mg, IQR 5.6-200.8). **Implications and Conclusions:** Maternal intakes of iron and folate above current recommendations and a higher intake of saturated fat increased the likelihood of a mother reporting adverse infant crying and sleep outcomes. Excessive infant crying is a common cause of accessing a primary healthcare provider. Future research should investigate the potential adverse effects of maternal intakes of nutrients above current recommendations on infants.

Does training in motivational interviewing techniques increase dietitians' confidence and improve counselling effectiveness in facilitating patient behaviour change?

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Objective: To review the current literature on the counselling effectiveness of motivational interviewing (MI) training for dietitians and contribute to the "Counselling Strategies" Knowledge Pathway of the Practice-Based Evidence in Nutrition[®] (PEN) database. The practice question examined if MI training sessions increase dietitians' confidence and counselling effectiveness in facilitating patients' behaviour change. **Methods:** A thorough literature search was conducted using the key words: dietitian, motivational interviewing, training, education, confidence, self-efficacy, effectiveness, and efficacy. Studies exploring perceptions and/or outcomes of MI training with dietitians and nutrition students were included. Most studies provided intervention to a combination of health care professionals, therefore studies that involved at least one dietitian were included. Eleven studies were found, with a variety of designs including pilot and feasibility studies, pre-test/post-test, cross-sectional, interventional prospective, and one randomized controlled trial. Total subjects (n=203) included 90 dietitians, with an additional 459 dietitians completing cross-sectional surveys. PEN[®] process and writer's guidelines were used to search for, evaluate, and grade the literature; and to develop evidence statements and Key Practice Points. **Results:** Literature on the impact of MI training (ranging from 5 to 48 hours) on dietitians' confidence in using techniques showed mixed results, with the majority indicating that training does improve confidence. The effectiveness of MI in behaviour change counselling improved post-training, however; proficiency in MI was not met. Some study results were measured by subjective methods, rather than objective. The literature discussed barriers to

dietitians effectively implementing learned techniques, but noted that participants were motivated to improve MI skills. **Implications/Conclusions:** The literature shows that MI training has the potential to increase dietitians' confidence and counselling effectiveness. Further research using objective measures and larger sample sizes is required to determine the validity of these results. Research is needed to determine the most effective approach to MI training for dietitians.

The perfect thiamine storm

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Objective: This review article advocates for clinical guidelines to help clinicians diagnose and treat thiamine deficiency in various patient populations. **Methods:** The literature compiled for this review includes a variety of case studies, case-control studies, and systematic and non-systematic reviews from 2000 or later. **Results:** Within 2-3 weeks deficiency can develop, because only a very small amount of thiamine is stored, about 30mg in the heart, brain, kidneys and liver and when thiamine is needed, it is rapidly utilized. Vitamin B₁ deficiency can present as dry beriberi, Wernicke's Encephalopathy (WE), Korsakoff's syndrome, wet beriberi, or shoshin beriberi. Astonishingly, only 10-16% of patients have all three classic WE symptoms including ocular abnormalities, gait disturbances, and mental status changes. Therefore, only 20% of WE patients are diagnosed before death and studies indicate that 85% develop the memory deficit disorder, Korsakoff's syndrome. Patients can die within hours from wet beriberi due to circulatory collapse and pulmonary edema. Due to its similarities with heart failure, wet beriberi is unfortunately misdiagnosed. Typically thiamine deficiency is thought of in alcohol-dependant patients; however, patient populations at risk for thiamine deficiency include: those with renal failure, on loop diuretics or certain medications, are chronically malnourished (i.e. from hyperemesis gravidarum, cancer, eating disorders etc.), have unexplained delirium or confusion, gastrointestinal diseases like Crohn's or ulcerative colitis, or those with unexplained heart failure. Currently there is no definitive diagnostic testing for thiamine deficiency and clinical observation remains the standard diagnostic tool; but evidently this is not a reliable indicator. Clinical practice guidelines also remain varied for thiamine supplementation. **Implications & Conclusions:** Vitamin B₁ remains under-diagnosed in critical care patients. This is due to non-definitive medical testing, and signs and symptoms lacking sensitivity and specificity. Clinical practice guidelines are needed to properly diagnosis and supplement thiamine deficiency in this varied patient population.

Innovater la promotion de la santé par la praxis avec les personnes défavorisées

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Objectifs : La participation des personnes défavorisées pour promouvoir leur propre santé est essentielle, mais ne peut pas leur être imposée. L'objectif était de comprendre comment ces personnes peuvent découvrir, pour elles-mêmes, ce qui nuit à leur santé et comment agir pour transformer cela. Plus spécifiquement, le projet visait à décrire ce qui nuit à leur santé et leurs actions, et d'examiner comment la praxis, soit l'action et la réflexion sur la réalité pour la transformer, modifie leurs perceptions et leurs actions. **Méthodes :** Une recherche-action participative avec méthodes qualitatives et basée sur la théorie de libération de Freire (1996) a été réalisée. Huit rencontres de groupe ont été menées en mettant de l'avant le dialogue et la présentation de problèmes, comme la présentation d'un objet représentatif ou le jeu de rôle, pour découvrir la réalité. Les rencontres ont été enregistrées et retranscrites de manière intégrale. L'analyse thématique comprenait la codification et la thématization inductive et selon la théorie de Freire et le cadre conceptuel des déterminants sociaux de la santé de Solar et Irwin (2010). **Résultats :** Huit participantes-chercheuses et participants-chercheurs bénéficiant de l'aide sociale se sont impliqués. Leur réalité sociale les empêchant de s'épanouir nuit à leur santé et les amène à fuir, à s'adapter ou à s'affirmer. Par la praxis, les personnes ont pris conscience de l'importance pour leur santé de prendre leur place et d'agir. L'expérience de groupe a aussi favorisé leur bien-être en leur permettant de s'exprimer sans jugement et d'apprendre ensemble. Implications et conclusions : Une plateforme pour chercher et créer ensemble les solutions face à ce qui nuit à la santé des personnes défavorisées favorise leur participation à la recherche de solutions et contribue à leur santé. La praxis et le dialogue s'avèrent essentiels pour une approche novatrice en promotion de la santé.

Exploring comfort nutrition practices in long term care

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Objectives: Comfort nutrition has been described as the transition from a therapeutic to liberalized diet as one moves towards end-of-life. However, practice guidelines or standards do not currently exist in Canada and the quality and appropriateness of current practices are unknown. The objective of this exploratory study was to gain an understanding of current comfort nutrition practices in selected long-term care facilities in Ontario, with the goal of identifying opportunities for optimizing care. **Methods:** Registered dietitians, nurse managers, and nutrition managers were identified as the population of interest. Using convenience sampling at professional conferences across Ontario, 56 professionals expressed interest and 14 registered dietitians were ultimately interviewed. The interview guide was developed and pilot tested by the research team and questions were designed to gather information about current comfort nutrition practices and perspectives. Structural and descriptive coding techniques were used to code the interview transcripts, and thematic analysis was informed by

the process described by Attride-Stirling. **Results:** The participants had 9.8 years of experience in long-term care, in facilities with an average capacity of 107 residents. Diverse current practices were documented with a wide range of definitions of comfort nutrition and practices surrounding liberalization. Three primary themes emerged, revealing comfort nutrition practice as: resident-focused, team-dependent, and needing practice guidance. **Implications and conclusions:** Our results suggest the need for a standardized definition of comfort nutrition, as well as the development of practice guidelines, policies and procedures using consistent terminology and practices for optimal care of residents. With adequate support and guidance, registered dietitians can play an integral role in leading interdisciplinary team education. Given that our work found diverse understandings of comfort nutrition, there needs to be further investigation into the definition of comfort nutrition using a Delphi consensus process.

Do women with gestational diabetes mellitus who attend an Island Health Diabetes Education Centre meet gestational weight gain recommendations? A retrospective chart review

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Objectives: To describe the gestational weight gain (GWG) of women with gestational diabetes mellitus (GDM) who attend an Island Health diabetes education centre (DEC), and to determine if these women meet their GWG targets as outlined by the Institute of Medicine (IOM) 2009 guidelines. **Methods:** The GWG of 20 singleton pregnancies was assessed via retrospective chart review. The GWG of each participant was compared to IOM recommendations. Gestational weight gain was calculated by self-reported pre-pregnancy weight and the weight at time of last visit to DEC (avg. 36.4 weeks). Pre-pregnancy weight was divided into BMI categories of underweight (<18.5), normal (18.5-24.9), overweight (25-29.9) and obese (>30). **Results:** 40% of participants achieved weight gain within the IOM recommendations, 25% gained above the IOM guidelines and the remaining 35% gained less than the recommended amount. Of those in the normal pre-pregnancy BMI category, 78% of participants met the IOM GWG guidelines with 20% falling below recommendations. Within the overweight pre-pregnancy BMI category, none of the women fell within the IOM recommended GWG guidelines, 80% gained excess of recommendations and 20% did not meet recommendations. In the obese category, 66% of those failed to reach the IOM GWG recommendations while 17% exceeded. **Implications and Conclusions:** Women diagnosed with GDM, whose gestational weight gain is above IOM recommendations, may be at increased risk of undesirable birth outcomes, including preterm delivery, having macrosomic infants, and cesarean delivery. Nutrition interventions (nutrition counselling, glucose monitoring, and insulin therapy) in women with GDM may be beneficial to help achieve gestational weight gain within the IOM guidelines and to potentially prevent undesirable birth outcomes.