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**17th** International  
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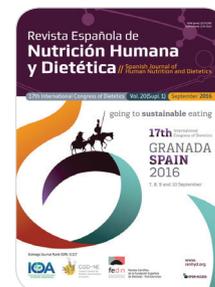


**ORAL  
COMMUNICATIONS**

# 17th International Congress of Dietetics

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## ORAL COMMUNICATIONS



7 September 2016  
APPLIED DIETETICS

### O-001: EVALUATING THE NUTRITION SCREENING PROGRAM WITHIN KIAMA MEALS ON WHEELS: PERSPECTIVES OF THE CLIENTS AND THEIR GENERAL PRACTITIONERS

Karen Walton<sup>1\*</sup>, Holly Pettingill<sup>1</sup>, Karen Charlton<sup>1</sup>, Anne McMahon<sup>1</sup>, Joanne North<sup>2</sup>, David Whiting<sup>2</sup>, Russell Pearson<sup>1</sup>

<sup>1</sup> University of Wollongong. <sup>2</sup> Kiama Meals on Wheels.

\*Contact: [kw Walton@uow.edu.au](mailto:kw Walton@uow.edu.au)

**Introduction:** Community living older adults have an increased malnutrition risk, which is associated with poor health outcomes, including reduced functionality and slower wound healing. Nutrition screening identifies individuals at risk of malnutrition and facilitates timely dietary intervention. This study evaluated a community based nutrition screening program for MOW clients; described trends in their nutritional status and explored the views of older adults and general practitioners (GPs) regarding nutrition screening. **Methods:** Community living adults over 65 years of age (n=34) underwent malnutrition screening using the MNA<sup>®</sup>-SF at baseline, three, six and nine months. One person completed all visits and the MNA<sup>®</sup>-SF scores were analysed using SPSS software. Participants were advised of their result and anyone who was malnourished, or at risk was given an appropriate nutrition education resource and referred to their GP, who was also advised of the results. Semi-structured interviews were conducted with older adults and GPs regarding their views on nutrition screening and follow up. Interviews were recorded, transcribed verbatim and analysed using

NVivo software to identify key themes and exemplar quotes. **Results:** MNA<sup>®</sup>-SF scores were significantly improved at the nine-months compared to baseline (P=0.02; 9% at risk/malnourished vs. 32%) and the number of nourished participants significantly increased (P=0.04). Receiving nutrition information (P=0.01) and making a dietary change (P=0.002) were associated with greater improvements in MNA<sup>®</sup>-SF scores. Older adults and GPs were satisfied with the implementation of the nutrition screening program and identified benefits that would further improve nutritional care. **Conclusions, discussion and/or practical application:** Timely nutrition screening enhances identification of community living older adults who are at risk of malnutrition, or are already malnourished, and assists nutritional care management. Further longitudinal analysis and links with key stakeholders are recommended to enhance early nutrition intervention and outcomes with our ageing population.

**COMPETING INTERESTS:** A Health and Community Care (HACC) Grant awarded to Kiama MOW allowed the evaluated project to be implemented.

## O-002: PATIENT REPORTED DIETARY TRIGGERS IN EOSINOPHILIC OESOPHAGITIS: ARE THEY CLINICALLY USEFUL?

Annabel Clancy<sup>1\*</sup>, Anne Swain<sup>2</sup>, Velencia Soutter<sup>2</sup>, Robert Loblay<sup>2</sup>

<sup>1</sup>School of Medicine, University of Wollongong, Wollongong, NSW, Australia; Allergy Unit, Royal prince Alfred Hospital, Sydney, NSW, Australia. <sup>2</sup>Allergy Unit, Royal prince Alfred Hospital, Sydney, NSW, Australia.

\*Contact: annabel.clancy@allergy.net.au

**Introduction:** Eosinophilic oesophagitis (EoE) is considered to be an allergic disease, with 10-50% of patients exhibiting IgE sensitisation to food. However, triggering foods often do not correspond to markers of immunological sensitisation, hence, dietary elimination strategies remain empirical. **Aim:** To report on the relationship between EoE patient reported triggers at presentation, allergen skin test results and triggers identified by dietary elimination and challenge. **Methods:** Patients of any age presenting to a metropolitan Allergy clinic prior to July 2015, with known EoE were identified. Patient files were systematically examined for patient reported triggers, allergen skin testing results, dietary interventions and challenge outcomes. The standard dietary intervention used excluded foods containing natural salicylates, biogenic amines and glutamate, as well as additives (preservatives, colourings), gluten, dairy, soy and selected allergens (determined by allergen tests). Those who improved symptomatically underwent a series of double-blind placebo controlled food chemical challenges followed by open whole food challenges. **Results:** Of the 116 patients (33<15yrs,

77M) identified, 94 reported  $\geq 1$  symptom trigger at baseline. Commonly reported triggers included: wheat (40%), dairy (39%), amine-containing foods (38%), salicylate-containing foods (37%), meat (35%), seafood 20%, nuts (16%) and egg (14%). Approximately half of those who reported seafood, nuts and eggs as triggers had sensitisation on allergen skin testing, compared to 15% who reported wheat and dairy as a trigger. Challenges were completed by 43 patients (14<15yrs). Common challenge reactions were to: milk (63%), amines (59%), antioxidants (50%), and wheat (43%). Patients were more likely to have correctly identified dairy (60%) and amine-containing foods (80%) as triggers at presentation, than wheat (23%) and salicylate-containing foods (30%). **Conclusions, discussion and/or practical applications:** Taking a thorough clinical history may provide assistance in selecting the most appropriate dietary elimination and challenge strategies for identification of dietary triggers in EoE.

**COMPETING INTERESTS:** The authors state that there are no conflicts of interest.

## O-003: A SHORT QUESTIONNAIRE FOR SCREENING SODIUM INTAKES – A FIRST STEP TO EFFECTIVE BLOOD PRESSURE MANAGEMENT

Lynda Ross<sup>1\*</sup>, Shu Han Chong<sup>2</sup>, Belinda Mason<sup>3</sup>, Helen Healy<sup>4</sup>

<sup>1</sup>Menzies Health Institute Queensland, Griffith University, Gold Coast, Queensland, Australia. <sup>2</sup>Tan Tock Seng Hospital, Singapore. <sup>3</sup>The Royal Brisbane and Women's Hospital, Herston, Queensland, Australia. <sup>4</sup>Department of Renal Medicine, The Royal Brisbane and Women's Hospital, Herston, Queensland, Australia.

\*Contact: lynda.ross@griffith.edu.au

**Introduction:** Assessing sodium intake is an important component of blood pressure management and risk reduction. This study aimed to develop and evaluate a short screening version of the Scored Sodium Questionnaire (SSQ) that has previously been validated in Australian Chronic Kidney Disease patients. **Methods:** A Scored Sodium Questionnaire-Screening Form (SSQ-SF) and scoring system were developed using data previously collected in 47 CKD outpatients participating in the SSQ validation study. The SSQ-SF was subsequently evaluated in outpatients with end-stage kidney disease and nursing staff at a Haemodialysis Kidney Clinic in Australia. Patients completed the SSQ, the SSQ-SF, and a feasibility questionnaire. Nurses completed a feasibility questionnaire. Main outcome measures were time and ease of completion; association and agreement between the SSQ and SSQ-SF scores; assessment

of binary classifications for sodium consumption: sensitivity and specificity. **Results:** Participants were 49 outpatients (61% male) aged 63.1 $\pm$ 14.8yrs and 16 nurses. Median time to complete the SSQ-SF was 4 minutes *versus* 10 minutes for the SSQ ( $p<0.01$ ), with strong agreement between individual scores and no fixed bias. Compared with the SSQ, the SSQ-SF score cut point of  $\geq 50$  successfully classified 23 of 27 participants as high sodium consumers: sensitivity 85% and specificity 68%. **Conclusions, discussion and/or practical application:** The SSQ-SF is quick and feasible to implement in the clinical setting and may be a useful first step for screening sodium intakes for referral into the Nutrition Care Process for blood pressure management.

**COMPETING INTERESTS:** The authors state that there are no conflicts of interest.

## O-004: UTILISING NUTRITION CARE PROCESS TERMINOLOGY TO EVALUATE THE EFFECTIVENESS OF ENTERAL NUTRITION CARE PROVIDED BY DIETITIANS IN AN ADULT ACUTE HOSPITAL SETTING

Siew Li Wong<sup>1\*</sup>, Yen Peng Lim<sup>1</sup>

<sup>1</sup>Tan Tock Seng Hospital, Nutrition and Dietetics Department, Singapore.

\*Contact: [siew\\_li\\_wong@ttsh.com.sg](mailto:siew_li_wong@ttsh.com.sg)

**Introduction:** The nutrition care process terminology (NCPT) is a systematic approach to providing high quality nutrition care practices and documentation. Electronic documentation utilising NCPT has been implemented by dietitians from an adult acute hospital setting. This study aimed to utilise NCPT to evaluate the effectiveness of enteral nutrition care provided by dietitians.

**Methods:** Retrospective study of enterally fed inpatients with initial assessments completed between 1<sup>st</sup> October 2013 and 31<sup>st</sup> March 2014 and receiving at least 2 dietitian consults (n=780). Data on dietitian consults, nutrition diagnoses and nutrition monitoring and evaluation indicators were extracted from electronic records. Subjects were categorised into 2 groups – (A) followed-up prior discharge (n=551); (B) not followed-up prior discharge (n=229). Descriptive statistics, independent sample t-test and chi-square test were conducted. **Results:** There were no difference in mean number of dietitian consults (3+/-1 versus 3+/-2, p=0.8) and median duration (days) to first follow-up 6 (range:0-55) versus 6 (range:0-116), p=0.4) between group A and B. The median number of follow-up consults to resolve/resolving diagnosis and meet indicator was 1

(range:1-6) in both groups. Common diagnoses evaluated as resolved/resolving were inadequate enteral nutrition infusion (70%) and malnutrition (11%). Common indicators evaluated as “met” were energy intake (34%) and protein intake (33%). Sixty-seven percent had their diagnoses resolved/resolving at first follow-up and further 9% at second follow-up. Significantly more subjects had their diagnoses resolved/resolving in group A compared to group B (83% versus 73%, p=0.003) whereas no difference was found for indicators evaluated as met (89% versus 85%, p=0.2). **Conclusions, discussion and/or practical application:** Patients with at least 1 follow-up consult progressed towards achieving their nutritional goals. Eighty percent of patients had their nutrition problems resolved/resolving. These findings are important in the development of appropriate monitoring and evaluation plan for patients in an adult acute hospital where inadequate enteral nutrition intake and malnutrition are common.

**COMPETING INTERESTS:** The authors state that there are no conflicts of interest.

## O-005: UTILISING NUTRITION CARE PROCESS TERMINOLOGY TO EVALUATE THE EFFECTIVENESS OF NUTRITION CARE PROVIDED BY DIETITIANS IN HOSPITALISED MALNOURISHED ADULTS

Yuan Xiang Alvernia Chua<sup>1\*</sup>, Yen Peng Lim<sup>1</sup>, Siew Li Wong<sup>1</sup>

<sup>1</sup>Tan Tock Seng Hospital, Nutrition And Dietetics.

\*Contact: [alvernia\\_chua@ttsh.com.sg](mailto:alvernia_chua@ttsh.com.sg)

**Introduction:** Nutrition care process terminology (NCPT) acts as a standardised language to document nutrition strategies and evaluate the effectiveness and quality of nutrition care provided. Incorporating NCPT into electronic health record facilitates collection and comparison of data regarding delivered care. This study aimed to utilise NCPT framework to evaluate the effectiveness of nutrition care provided by dietitians for malnourished patients in an adult acute hospital setting. **Methods:** Inpatient initial assessments completed by dietitians between 1<sup>st</sup> October 2013 and 31<sup>st</sup> March 2014 (n=3392) were extracted from electronic documentation. Those with nutrition diagnosis of “malnutrition” were included

(n=828, 24%). Subjects were categorised into 2 groups – (A) seen by dietitian prior discharge (n=240, 29%); (B) not seen by dietitian prior discharge (n=588, 71%). Data on dietitian consults, nutrition diagnoses, nutrition interventions, nutrition monitoring and evaluation indicators were retrieved. Descriptive statistics, independent sample t-test and chi-square test were conducted. **Results:** Common diagnoses (n=710) accompanying malnutrition was inadequate oral intake (18%) and inadequate enteral nutrition infusion (12%). Common interventions (n=2604) were collaboration with other providers (31%) and commercial beverage (20%). Energy (37%) and protein intake (37%) were commonly used

indicators (n=1527). There was no difference in mean number of dietitian consults ( $3+/-1$  versus  $3+/-2$ ,  $p=0.3$ ) between group A and B. Group A had a significantly higher proportion of diagnoses that were "resolved/resolving" (61% versus 48%,  $p<0.01$ ) and indicators that were "met" (58% versus 49%,  $p=0.01$ ) when compared to group B. Malnutrition (25% versus 23%,  $p=0.01$ ) and inadequate enteral nutrition (48% versus 36%,  $p=0.02$ ) had a significantly higher proportion "resolved/resolving" in group A compared to group B. **Conclusions,**

**discussion and/or practical application:** This study showed that dietetics consult prior discharge assisted towards resolution of malnutrition and inadequate enteral nutrition, contributing towards achievement of adequate energy and protein intake. Additionally, inter-professional collaboration was important to the management of malnutrition.

**COMPETING INTERESTS:** The authors state that there are no conflicts of interest.



7 September 2016  
MASS CATERING

## O-046: EFFECTIVENESS OF NATURAL DISINFECTANTS ON THE TOTAL ANTIOXIDANT CAPACITY OF THE SOME RAW SERVED VEGETABLES USED IN FOOD SERVICE SYSTEMS

Mercan Merve Tengilimoğlu Metin<sup>1\*</sup>, Ziya Erokay Metin<sup>2</sup>, Mevlüde Kizil<sup>3</sup>, M. Fatih Uyar<sup>3</sup>, Gülgün Ersoy<sup>4</sup>

<sup>1</sup> Hacettepe University, Faculty of Health Sciences, Department of Nutrition and Dietetics, Turkey. <sup>2</sup> Presidency of Turkish Republic Health Department MSc. Dietation. <sup>3</sup> Hacettepe University, Faculty of Health Sciences, Department of Nutrition and Dietetics, Turkey. <sup>4</sup> Turgut Özal University, Faculty of Health Sciences, Department of Nutrition and Dietetics, Turkey.

\*Contact: [tengilimoglu@hacettepe.edu.tr](mailto:tengilimoglu@hacettepe.edu.tr)

**Introduction:** The most important point keeping the quality of fruits and vegetables is reducing microbial load. Each step in the production chain will influence microbial accumulation and disinfection is one of the most critical steps in food service systems. Chlorine is a efficient sanitation agent but the reliability of the chemical preservatives is controversial due to carcinogenic, teratogenic and toxic remnants. Natural sanitasors arouse interest. A study investigating the effect of natural commercial disinfectants on antioxidant capacity has not been conducted. **Methods:** This study is conducted to compare the effects of disinfection of the some raw served vegetables commonly used food service systems with chlorine and some natural commercial disinfectants on total antioxidant capacity. The lettuce and red cabbage samples was treated with 4 different washing methods (control-tap water, chlorine, 2 natural commercial disinfectant). Total antioxidant capacity of vegetables was determined with TEAC method. **Results:** Average value of antioxidant capacity of lettuce samples after washing with control, chlorine,

natural commercial disinfectant I (DT1), natural commercial disinfectant II (DT2) are 0.83, 0.7, 0.83, 0.9mmol/L, respectively and the antioxidant capacity of red cabbage samples are 0.87, 0.77, 0.8, 0.97mmol/L, respectively. After washing with chlorine, average value of total antioxidant capacity was determined lower than the control. This difference was statistically significant ( $p < 0.05$ ). After washing with DT2, average value of total antioxidant capacity was determined higher than the control. This difference was statistically significant ( $p < 0.05$ ). **Conclusions, discussion and/or practical application:** The findings of this study showing that the natural commercial disinfectants which can be used alternative for chlorine has an effect on total antioxidant capacity of vegetables positively and chlorine influences the antioxidant capacity. Natural commercial disinfectants may be preferred due to the lack of an adverse effect on antioxidant capacity in food service systems.

**COMPETING INTERESTS:** The authors state that there are no conflicts of interest.

## O-047: AN OVERALL QUALITY ASSESSMENT OF NUTRITIONAL SERVICES IN RESIDENTIAL/NURSING HOMES IN TURKEY

Dilek Ongan<sup>1\*</sup>, Neslisah Rakicioglu<sup>2</sup>

<sup>1</sup> Izmir Katip Celebi University, Faculty of Health Sciences, Department of Nutrition and Dietetics, Izmir-Turkey.

<sup>2</sup> Hacettepe University, Faculty of Health Sciences, Department of Nutrition and Dietetics, Ankara-Turkey.

\*Contact: [dkatranaci@gmail.com](mailto:dkatranaci@gmail.com)

**Introduction:** A better quality nutrition care for institutionalized elderly helps improve satisfaction, nutrition and health status of the residents. In this study, providing overall assessment of nutritional quality of Turkish residential/nursing homes was aimed. **Methods:** Nutrition services were evaluated with "Food and Nutritional Care Indicators in Assisted-Living Facilities for Older Adults" and "Menu Checklists" in 25 institutions chosen with stratified sampling method among NUTS 1 regions throughout Turkey. Hygiene perception of foodservice staff was investigated and food safety practices were observed. **Results:** Twelve of the institutions (48.0%) had dietitians. The percentages of food consumption in snacks were found 76.0%. Pastries, dairy products/fruits/juices or milk+fruit were served most frequently between meals (27.8% and 16.6%, respectively). Menu control had good level at institutions. Foodservice staff education about personal (32.2%) and food (28.6%) hygiene were given mostly by nurses (37.1%). It was determined that 65.11±10.53% of the indicators in "Food and Nutritional Care Indicators in Assisted Living Facilities for Older Adults" was complied by the institutions. Some general and therapeutic

nutrition services were lacking; healthy cooking methods, provision of similar meals for meals missed/rejected by the residents, monitoring body weight, assessment of nutritional status, updating diet menus. Nutrition services and menu control were significantly better in the institutions in which dietitians worked ( $p<0.05$ ). Score of food safety practices of residential homes was 66.84±7.96. Score of hygiene perception of staff was 154.46±12.74, lowest perception was on personal hygiene and rules for hand hygiene were not followed. Staff wore right shoes, dressed clean (84.0%), had clean and short nails (100%), however they did not follow hygienic hand washing rules. **Conclusions, discussion and/or practical application:** Nutrition services and food safety should be improved in residential homes by increasing dietitian employment and conducting audits with checklists to give better nutritional care. Food safety practices should be improved by regular training sessions for foodservice staff.

**COMPETING INTERESTS:** The authors state that there are no conflicts of interest.

## O-048: DIETARY INTAKES OF HOSPITAL PATIENTS IN VIET NAM

Mary Hannan-Jones<sup>1\*</sup>, Sally Smith<sup>1</sup>, Amanda Adams<sup>1</sup>, Diep Do<sup>2</sup>, Danielle Gallegos<sup>1</sup>, Cuong Quoc Tran<sup>3</sup>

<sup>1</sup> Queensland University of Technology. <sup>2</sup> Ho Chi Minh City Nutrition Centre, Ho Chi Minh City, Viet Nam. <sup>3</sup> Ho Chi Minh City Nutrition Centre, Ho Chi Minh City, Viet Nam, Queensland University of Technology.

\*Contact: [m.hannan-jones@qut.edu.au](mailto:m.hannan-jones@qut.edu.au)

**Introduction:** In Viet Nam, food provision to patients via hospital foodservices is not common practice, with only select private hospitals and/or patient types receiving this service. For the most part, patients purchase their own food or have family members provide it. The Ministry for Health in Viet Nam has recently set targets for hospital foodservices to be developed and provide food to patients within the next 10 years, along with a nutrition and dietetics workforce. The aim of this study was to describe the current dietary intakes and food sources of patients in hospitals in Viet Nam to inform directions for foodservice standards and dietetic practice. **Methods:** Cross-sectional observational design of adult patients at two acute hospitals in Viet Nam. Dietary intakes were assessed via 24 hour recall supported with visual tools. Diets were analysed according to the local food composition database. **Results:** Of 154 eligible patients recruited, dietary intakes were analysed for 147 patients, mean age 53.5 years

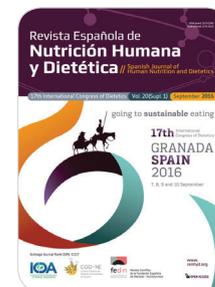
(±17.3), 53.1% female, with an average length of stay 3.0 days. Reported energy and protein intakes were 5328kJ (±2348kJ) 52.4g (±26.0g) for males and 4229kJ (±1952kJ) 42.1g (±20.0) for females. Majority of reported dietary intakes were consumed at three main meal times, with the fewer mid-meals consumed being lower in nutritional quality. The number of patients who purchased all their own meals or had all their meals brought to them daily were similar at 35.4% and 34.7% respectively, with most of these foods sourced from canteens co-located on the hospital grounds. Foods reported to be consumed reflected cultural eating patterns. **Conclusions:** This study provides insight into the eating practices of patients in hospitals in Viet Nam, and supports the development of practical nutrition standards and menu planning guidance for the transition to hospital provided food to underpin client-centred nutrition care.

**COMPETING INTERESTS:** The authors state that there are no conflicts of interest.

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## ORAL COMMUNICATIONS



8 September 2016

CLINICAL NUTRITION AND DIET THERAPY

### O-006: COMPLEXITY OF NUTRITION SCREENING IN PATIENTS ADMITTED WITH AN EXACERBATION OF CHRONIC OBSTRUCTIVE PULMONARY DISEASE (COPD)

Jenna Stonestreet<sup>1,\*</sup>, Philip Masel<sup>2</sup>, Ian Yang<sup>2</sup>, Peter F Collins<sup>3</sup>

<sup>1</sup> Nutrition and Dietetics Department, The Prince Charles Hospital, Brisbane, Queensland, Australia. <sup>2</sup> Department of Thoracic Medicine, The Prince Charles Hospital, Brisbane, Queensland, Australia. <sup>3</sup> Nutrition & Dietetics, School of Exercise and Nutrition Sciences, Faculty of Health, Queensland University of Technology, Brisbane, Queensland, Australia.

\*Contact: [jenna.stonestreet1@gmail.com](mailto:jenna.stonestreet1@gmail.com)

**Introduction:** Malnutrition is a common problem in patients with COPD, with prevalence rates of up to 60% in inpatients reported. Current Australian guidelines do not formally recommend nutritional screening and data on malnutrition is scarce. This study aimed to investigate the prevalence of malnutrition in Australian COPD inpatients. **Methods:** A prospective longitudinal observational study recruited patients hospitalized for an exacerbation of COPD at The Prince Charles Hospital. Malnutrition risk was established using the Malnutrition Screening Tool (MST). This was completed within 24hrs of admission by respiratory nurses as part of routine care. Overall nutritional status was assessed by a dietitian using the Subjective Global Assessment (SGA) in conjunction with ICD-10 AM criteria to diagnose malnutrition. **Results:** Fifty patients were included of which 21 were malnourished (42%). MST identified 19 patients at risk of malnutrition (38%). Of the 19 patients identified using MST, 16 were classified as malnourished and

3 well nourished by SGA. There was substantial agreement between the screening and assessment tools ( $\kappa = 0.667$ ;  $p < 0.001$ ), the MST had a sensitivity of 76% and a specificity of 90%. However, the MST classified 5 individuals as not at risk who were assessed as being malnourished ( $X^2 p < 0.001$ ), these patients would not have been referred to see a Dietitian. If a BMI cut-off of  $21 \text{ kg/m}^2$  in addition to MST were used to screen, 3 of the 5 patients would have been identified. **Conclusion:** Malnutrition is highly prevalent in COPD yet challenges remain on how best to identify those at nutritional risk. As a minimum all patients should be routinely screened for malnutrition although it should be recognized that some patients are likely to remain unidentified. Further research into nutrition screening methods in this group is required.

**COMPETING INTERESTS:** The authors state that there are no conflicts of interest.

## O-007: DIFFICULTIES AND OPPORTUNITIES RELATED TO THE NUTRITION OF CANCER PATIENTS

Nóra Galló<sup>1\*</sup>, Mária Varga<sup>2</sup>, Csaba Orbán<sup>1</sup>, Erzsébet Pálfi<sup>1</sup>, Katalin Tátrai-Németh<sup>1</sup>

<sup>1</sup>Semmelweis University, Faculty of Health Sciences, Department of Dietetics and Nutrition Sciences.

<sup>2</sup>Szent Imre University Teaching Hospital, Dietetic Services.

\*Contact: gallonora@yahoo.co.uk

**Introduction:** The tumour and treatments have effects on metabolism, nutrition and thus nutritional status. Our aims were to reveal nutritional difficulties leading to malnutrition and sarcopenia; to survey patients' nutritional status and malnutrition risk. Moreover, patients' energy and nutrient intake, their nutrition habits regarding quantity and quality were assessed. The possibilities of dietetic interventions were aimed to explore, thus the question of clinical nutrition was also raised. **Methods:** Inpatients (64.33±18.62yrs; 22male/23female) and outpatients (63.38±16.08yrs; 9male/15female) were involved, since patients should be provided with different dietetic services in these areas. Malnutrition risk screening was performed with the validated NRS 2002. Nutritional status was determined based on measured anthropometric parameters and body composition analysis using a 4-point Omron BF500 BIA device. Diet changes were measured by 3-day food diaries and 24-hour food recalls. Patients' energy and nutrient intake were assessed by applying NutriComp software. **Results:** All inpatients are at risk of malnutrition (60% moderately, 12%

severely). The decrease in muscle mass can be estimated based on calculated values. 16% of the outpatients are at risk of mild malnutrition and 8% had anorexia. 72% of the outpatients are overweight-obese, however, beside fat dominance, sarcopenia is also likely in 80%. Inpatients consumed 1,800kcal/day, including supplementary feeding. 22% received supplementary formulas, still only 50-75% of the recommended amount is consumed. 41% of severe risk patients do not get Oral Nutrition Support (ONS) at all. **Conclusions, discussion and/or practical application:** Malnutrition risk screening and body composition analysis are of high importance in this particular patient group. Early identification of sarcopenia and malnutrition would allow dietitians, working as members of the nutrition teams, to implement timely nutrition support (supplement formulas, tube or parenteral nutrition) based on the Nutrition Care Plan Models (NCPM) recommended by the British and American Dietetic Associations.

**COMPETING INTERESTS:** The authors of this document can confirm there is no conflict of interest.

## O-008: PHASE ANGLE AS A MARKER OF NUTRITIONAL STATUS AND PREDICTOR OF SURVIVAL IN END STAGE RENAL DISEASE (ESRD) PATIENTS

Anastasia Markaki<sup>1\*</sup>, Ioannis Kyriazis<sup>2</sup>, Kalliopi Makrogiannaki<sup>1</sup>, Paraskevi Nikodimou<sup>1</sup>, Irene Sfakianaki<sup>1</sup>, Kostantinos Perakis<sup>3</sup>, Konstantinos Stylianou<sup>3</sup>

<sup>1</sup>Department of Nutrition and Dietetics, Technological Education Institute (TEI) of Crete, Greece. <sup>2</sup>Department of Nephrology, General Hospital of Chios, Chios, Greece. <sup>3</sup>Department of Nephrology, University Hospital of Heraklion, Crete, Greece.

\*Contact: markakin@hotmail.com

**Introduction:** Bioelectric impedance (BIA) is a simple, safe and non-invasive method of assessing body composition changes in human. Phase angle (PA), as a parameter of BIA analysis, reflects the cell mass, the tissue hydration and the integrity of cell membranes, therefore used as a nutritional marker for the general population. In the present study we aim to assess the clinical use of PA in ESRD patients. **Methods:** 101 ESRD patients, 47 on hemodialysis (HD) and 54 on peritoneal dialysis (PD) were recruited from the University Hospital of Crete. Patients' nutritional status was evaluated through BIA analysis, anthropometric measurements and biochemical markers at baseline. Patients followed for 48 months where cardiovascular (CVD) and non-cardiovascular (non-CVD) deaths were recorded. **Results:** Median value of PA was 5.6. Patients with PA<5.6 were older, longer time on dialysis and

had higher CRP values compared to patients ≥5.6. Phase angle was significantly correlated to markers of adequate nutritional markers, both anthropometric (mid-arm muscle circumference, MAMC, rho=+0.203; p<0.05), and biochemical (albumin, pre-albumin, transferrin, creatinine, rho=+0.200; p<0.05) and inversely associated with Malnutrition Inflammation Score (MIS) (rho=-0.472; p<0.001). During follow-up 31 patients died, 16 of CVD (51.6%). Patients with PA<5.6 had significant higher all-cause and CVD mortality, compared to patients ≥5.6, even after adjustment for age, sex, history of CVD at baseline, mode of dialysis and diabetes (unadjusted hazard ratio (HR):4.04 [95% CI, 1.74-9.39] and adjusted HR:3.38 [95% CI, 1.34-8.53] for all-cause mortality; unadjusted HR:4.94 [95% CI, 1.41-17.36] and adjusted HR:4.88 [95% CI, 1.21-19.71] for CVD mortality). **Conclusions, discussion and/or practical application:** PA

proved to be a valuable tool for assessing ESRD patients' nutritional status in clinical practice, thus used as a reliable nutritional marker and predictor of survival. Therefore PA could be used for early detection of malnutrition and inflammation

of ESRD patients.

**COMPETING INTERESTS:** The authors of this document can confirm there is no conflict of interest.

## O-009: STATISTICAL SURVEY OF OBESITY AND UNDERWEIGHT AMONG INPATIENTS WITH SCHIZOPHRENIA THROUGHOUT JAPAN

Yukiko Inamura<sup>1\*</sup>, Toyooki Sagae<sup>2</sup>, Osamu Kushida<sup>1</sup>, Nobuko Murayama<sup>3</sup>

<sup>1</sup>Niigata University of Health and Welfare. <sup>2</sup>Yamagata Prefectural Yonezawa University of Nutrition Sciences.

<sup>3</sup>University of Niigata Prefecture.

\*Contact: inamura@nuhw.ac.jp

**Introduction:** Many studies have reported a high prevalence of obesity in patients with schizophrenia compared to the general population. This study aimed to conduct a large-scale survey of BMI among hospitalized patients with schizophrenia in Japan, identify the prevalence of obesity and underweight, and examine its associated factors. **Methods:** This was a cross-sectional study. The subjects were 14,591 schizophrenic inpatients (7,645 males and 6,946 females) with complete data from 89 facilities in Japan that agreed to participate in this study. Survey items included age, gender, height, weight, BMI, length of hospital stay, antipsychotic agents, and types of hospital ward, and the survey took place between July to December 2010. **Results:** When the BMI distribution was compared between the general adult population and patients, the percentage of obesity was 26.1% in the general population and 21.9% in the patients, being lower among the patients, and the percentage of underweight was 7.0% in the general population and 19.5% in the patients, being 2.8 times

higher among the patients. Subsequently, logistic regression was used to examine factors associated with obesity and underweight. As the results, the obesity odds ratio was 1.42 times higher in patients receiving  $\geq 4$  antipsychotic agents than those receiving single typical agents, and 0.58 times higher in patients kept in a locked ward than those in an open ward. The underweight odds ratio was 0.7 times higher in patients receiving  $\geq 4$  antipsychotic agents than those receiving single typical or atypical agents, and 1.81 times higher in patients kept in a locked ward than those in an open ward. **Conclusions:** Obesity in Japanese schizophrenic inpatients was associated with  $< 3$ -month hospitalization, antipsychotic polypharmacy, and an open ward; whereas underweight was associated with  $\geq 3$ -month hospitalization, administration of single typical or atypical antipsychotic agents, and a locked ward, independent from age and gender.

**COMPETING INTERESTS:** The authors of this document can confirm there is no conflict of interests.

## O-010: EXPLORING THE BARRIERS AND OPPORTUNITIES TO DINING OUT FOR PEOPLE LIVING WITH A DISABILITY

Karen Walton<sup>1\*</sup>, Jacob McGinness<sup>1</sup>, Karly Rugolo<sup>1</sup>, Shawn Burns<sup>2</sup>

<sup>1</sup>School of Medicine, University of Wollongong, Wollongong, NSW, Australia. <sup>2</sup>School of Medicine, University of Wollongong, Wollongong, NSW, Australia; School of Arts, English and Media, University of Wollongong, Wollongong, NSW, Australia.

\*Contact: k Walton@uow.edu.au

**Introduction:** Malnutrition is a significant issue that has impacts in the community, in healthcare and also for people living with disabilities such as dysphagia, or dependence on others for their meals. People living with a disability (18.5% of Australians) may experience exclusion from some mealtime and social activities. Eating with others can improve dietary intakes and may be of benefit to people who are malnourished, or at risk, for this reason, as well as the importance social interaction. This qualitative study is part of a larger project that explored the barriers and opportunities to dining out in

restaurants and cafés, from the standpoint of the person with a disability and from the business owner's perspective. **Methods:** Fourteen surveys, nine interviews and two focus groups were facilitated to explore the views and experiences of the food businesses, and those of the people living with a disability in the Nowra area of New South Wales. Digital recordings were made and verbatim typed transcripts were prepared before thematic analysis. **Results:** Three key themes summarized the key barriers and facilitators from the perspective of both stakeholder groups; the physical environment (e.g., wheelchair

access), menu and attitudes (e.g., texture modified options), and knowledge and customer service (e.g., care with meal placement). Staff education and training about knowledge and communications with people with disabilities is recommended; as are layout changes that could be made a minimal cost, but would enhance use by people with a disability. **Conclusions:** Greater inclusion in dining out and mealtimes has a range of benefits, including social interaction and access to nutrition

in a welcoming environment. The larger, overarching study is ongoing and aims to establish an inclusive dining culture ('InCuisine') in the Nowra area as a model, before exploring other locations.

**COMPETING INTERESTS:** A University of Wollongong Community Engagement Grant (\$10,000) provided funding for this project.

## O-011: OBESITY IS ON THE RISE IN ADULTS WITH CYSTIC FIBROSIS – A SINGLE CENTRE STUDY

Jenna Stonestreet<sup>1\*</sup>, Angela Matson<sup>1</sup>, Karen Herd<sup>1</sup>

<sup>1</sup>Adult Cystic Fibrosis Centre, The Prince Charles Hospital, Brisbane, Queensland, Australia.

\*Contact: [jenna.stonestreet1@gmail.com](mailto:jenna.stonestreet1@gmail.com)

**Introduction:** Cystic Fibrosis (CF) has long been associated with malnutrition and a low Body Mass Index (BMI). Advancements in treatment options and early diagnosis have increased the survival rate of individuals with CF. The aims of this study were to determine the prevalence of obesity in adults with Cystic Fibrosis attending a single Australian centre between 2009-2013 and to describe their characteristics. **Methods:** The Australian Cystic Fibrosis Data Registry was used to audit all patients attending the Adult Cystic Fibrosis Centre, Brisbane between 2009 and 2013. The highest Body Mass Index (BMI) was recorded quarterly and an overall average was used to categorize patients into BMI bands. The prevalence of patients with a BMI>30kg/m<sup>2</sup> was then calculated over a five year period. Of the group with a BMI>30kg/m<sup>2</sup>, additional demographic and clinical information was collected and analysed for trends.

**Results:** The data revealed an increase in the percentage of adults with a BMI>30kg/m<sup>2</sup> from 4.48% in 2009 to 7.1% in 2013. Of the BMI>30 kg/m<sup>2</sup> group in 2013, the mean (SD) age, BMI and FEV1 predicted were 31.2±11.6yrs, 33.8±5.4kg/m<sup>2</sup> and 67.4±23.1% predicted. A further analysis of the 2013 group demonstrated 50% of patients were pancreatic insufficient, 3 had Cystic Fibrosis Related Diabetes and 3 were F508del homozygous. **Conclusions:** The prevalence of obesity in adult cystic fibrosis patients attending a single Australian centre is increasing, and 50% of those patients with a BMI>30kg/m<sup>2</sup> are pancreatic insufficient. Innovative approaches need to be considered for weight reduction in this group, and CF dietitians and treating teams may need to be up-skilled in this area.

**COMPETING INTERESTS:** The authors of this document can confirm there is no conflict of interests.

## O-013: EFFECTS OF FLAVONOIDS ON OXIDATIVE STRESS AND INFLAMMATION IN ADULTS AT RISK FACTOR OF CARDIOVASCULAR DISEASE: A SYSTEMATIC REVIEW

Jenni Suen<sup>1\*</sup>, Jolene Thomas<sup>1</sup>, Amelia Kranz<sup>1</sup>, Simon Vun<sup>2</sup>, Ian Spark<sup>2</sup>, Michelle Miller<sup>1</sup>

<sup>1</sup>Nutrition and Dietetics, Flinders University. <sup>2</sup>Department of Vascular Surgery, Flinders Medical Centre.

\*Contact: [suenjenni@gmail.com](mailto:suenjenni@gmail.com)

**Introduction:** Oxidative stress and inflammatory processes initiate the first stage of cardiovascular disease (CVD), a major cause of death in western countries. Literature suggests that flavonoids exhibit antioxidant and anti-inflammatory properties, which significantly improve flow-mediated dilation and blood pressure. The mechanism of action is unknown and the effect of flavonoids on markers of oxidative stress and inflammation on individuals with a CVD risk factor is yet to be reviewed. **Methods:** Systematic literature searches were conducted in MEDLINE, Cochrane Library, CINAHL and SCOPUS databases.

Randomized control trials conducted in a western country that provided a food-based flavonoid intervention to participants with one or two modifiable risk factor for CVD, measuring a marker of oxidative stress and/or inflammation were included. Reference lists of included articles were hand-searched to source relevant articles. The Cochrane Collaboration Risk of Bias Tool was used to assess study quality. **Results:** The search strategy retrieved 1248 articles. Eighteen articles met the inclusion criteria. One article was sourced through hand-searching. Nineteen articles were reviewed. Eight studies were considered at low risk of

bias. The provision of cocoa flavonoids to type 2 diabetics and olive oil flavonoids to mildly hypertensive women reduced oxidative stress and inflammation. However this reduction was not statistically significant. Effects observed from other food sources were much weaker. **Conclusion, discussion and/or practical application:** Flavonoids appear to reduce markers of oxidative stress and inflammation in patients with a CVD risk factor, particularly when provided as cocoa or olive oil. Inter-

study comparisons were challenging due to heterogeneity between studies. Further rigorously designed studies with a large sample size of both genders, utilizing CVD risk specific hs-CRP, as a marker of inflammation, will assist in determining the effectiveness of flavonoid interventions in patients with CVD risk factors.

**COMPETING INTERESTS:** The authors of this document can confirm there is no conflict of interests.

## O-014: RANDOMIZED TRIAL TO ASSESS THE EFFECTS OF DAILY WALNUT CONSUMPTION FOR 2 YEARS ON AGE-RELATED COGNITIVE DECLINE AND MACULAR DEGENERATION IN HEALTHY ELDERLY INDIVIDUALS: THE WALNUTS IN HEALTHY AGING (WAHA) STUDY

Mercè Serra-Mir<sup>1,\*</sup>, Ana Pérez-Heras<sup>1</sup>, Irene Roth<sup>1</sup>, Tania-Marisa Freitas-Simoes<sup>1</sup>, Sujatha Rajaram<sup>2</sup>, Joan Sabaté<sup>2</sup>, Emilio Ros<sup>1</sup>

<sup>1</sup>Lipid Clinic, Endocrinology and Nutrition Service, Hospital Clínic, Barcelona, Spain.

<sup>2</sup>School of Public Health, Loma Linda University, Loma Linda, CA.

\*Contact: serramir@clinic.ub.es

**Introduction:** Chronic oxidation and inflammation are believed to underlie diseases of aging such as age-related cognitive decline (ARCD) and macular degeneration (AMD). n-3 Polyunsaturated fatty acids (n-3 PUFA) accrue in brain at early life stages and are reputed to be neuroprotective. Walnuts supply both abundant polyphenolic antioxidants and  $\alpha$ -linolenic acid (ALA, the vegetable n-3 PUFA). **Objectives and target population:** To determine whether consumption of walnuts for 2 years will delay onset and progression of ARCD and AMD in healthy elders (63 to 79 years-old). **Previous theories and investigations:** Small human studies have shown beneficial effects of polyphenol-rich foods on brain and retinal health. Walnuts improve memory and motor function in experimental animals. **Intervention(s):** Dual center (Loma Linda University, USA and Hospital Clínic, Barcelona, Spain), randomized nutrition intervention trial. At each site  $\approx$ 350 healthy eligible candidates were recruited and randomized to either habitual diet without nuts (control) or habitual diet with walnuts at  $\approx$ 15% of energy (30-60g/day depending on energy requirements). Sachets of raw pieced walnuts are provided to the walnut group, together with recipes and the recommendation to finely grind them if difficulty chewing. **Evaluation:** Main outcomes are changes in ARCD and AMD as assessed by standardized

cognitive function tests and eye examination including optical coherence tomography administered at baseline and 2 years. Structural and functional brain magnetic resonance imaging is performed in a subset of participants in Barcelona. All participants have quarterly visits for dietary assessment and adiposity measurements. **Results:** By 20 November 2015 all participants have completed 1 year of follow-up and 575 have finished the study. Dropouts for various reasons are  $<$ 10%. **Conclusions of authors and discussion:** Based on the nutrient components of walnuts, particularly ALA and polyphenols, we anticipate that daily consumption for 2 years will have a beneficial impact on ARCD and AMD compared to the control diet.

**COMPETING INTERESTS:** Joan Sabaté and Emilio Ros have received research funding through their institutions from the California Walnut Commission and are non-paid members of its scientific advisory committee. No other authors declare a conflict of interest.

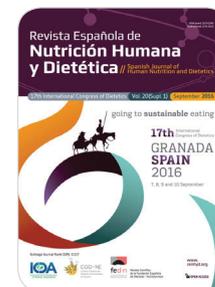
Support or Funding Information. The WAHA study is funded by the California Walnut Commission. Walnuts in Healthy Aging (WAHA) trial (<https://clinicaltrials.gov/ct2/show/NCT01634841>).



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## ORAL COMMUNICATIONS



8 September 2016

COMMUNITY NUTRITION AND PUBLIC HEALTH

### O-017: ARTIFICIAL SWEETENERS AND RISK OF DEPRESSION: A 16-YEAR PROSPECTIVE FOLLOW-UP OF THE NURSES' HEALTH STUDY

Michel Lucas<sup>1,\*</sup>, Alexander C. Tsai<sup>2</sup>, Eilis J. O'Reilly<sup>3</sup>, Walter C. Willett<sup>4</sup>, Olivia I. Okereke<sup>5</sup>, Alberto Ascherio<sup>4</sup>

<sup>1</sup>Department of Nutrition, Harvard T.H. Chan School of Public Health, Boston, MA, USA; Department of Social and Preventive Medicine, Université Laval, Québec City, Québec, Canada. <sup>2</sup>Department of Psychiatry, Massachusetts General Hospital, Boston, USA. <sup>3</sup>Department of Nutrition, Harvard T.H. Chan School of Public Health, Boston, MA, USA. <sup>4</sup>Departments of Nutrition and Epidemiology, Harvard T.H. Chan School of Public Health; Channing Division of Network Medicine Department of Medicine, Harvard Medical School, Boston, MA, USA. <sup>5</sup>Channing Division of Network Medicine Department of Medicine, Harvard Medical School; Department of Epidemiology, Harvard T.H. Chan School of Public Health; Department of Psychiatry, Brigham and Women's Hospital and Harvard Medical School, Boston, MA.

\*Contact: [mlucas@hsph.harvard.edu](mailto:mlucas@hsph.harvard.edu)

**Background:** Artificial sweeteners such as aspartame have been suspected of having adverse neurological effects. However, existing data are equivocal and there have been no large prospective studies on aspartame and depression risk.

**Methods:** This prospective cohort study involved 44 398 women (mean age, 63 years) participating in the US Nurses' Health Study who were free from depressive symptoms at baseline. Intakes of artificial sweeteners, from artificially sweetened beverages (ASB) and aspartame (packets) added to foods, were obtained from validated questionnaires and computed as the cumulative average of intake between 1994 through 2010. Incident depression was defined as reporting both a new physician-diagnosed depression and beginning regular antidepressant use. Relative risks (RR) of clinical depression

were estimated using Cox proportional hazards regression models. **Results:** During 16 years of follow-up (1996-2012), 3 370 incident cases of clinical depression were documented. Compared to women drinking one serving of ASB (a glass, can or bottle) less than once per month, the multivariable adjusted-RR of clinical depression was 1.22 (95% CI: 1.09, 1.36, P for trend). **Conclusions:** In this large longitudinal study, more frequent consumption of ASB and added aspartame were associated with incident depression, and their associations were additive. Confirmatory studies are needed to determine if aspartame consumption is a risk factor for depression.

**COMPETING INTERESTS:** The authors state that there are no conflicts of interest.

## O-019: BUILDING CAPACITY AND CREATING HEALTHY ENVIRONMENTS THROUGH SHORT, EVIDENCE-BASED HEALTHY LIVING VIDEOS

Jane Bellman<sup>1,\*</sup>, Kerri Staden<sup>1</sup>, Kay Watson Jarvis<sup>2</sup>, Sheila Tyminski<sup>3</sup>

<sup>1</sup>Dietitians of Canada. <sup>2</sup>No specific affiliation. <sup>3</sup>Alberta Health Services.

\*Contact: jane.bellman@dietitians.ca

**Introduction:** Raising Our Healthy Kids (<http://www.raisingourhealthykids.com/>) videos were created to help families lead healthier lives by providing information on nutrition and healthy eating; active living and play; positive parenting; oral and mental health; and media literacy, some with aboriginal themes. **Objectives and target population:** Produce 70 open access, short, high quality, evidence-based healthy living videos to support families, caregivers, teachers and child-service agencies across Canada and internationally.

**Previous theories and investigations:** Videos were built on experience gained from four demonstration videos (CTV 50-100 airings/week; >2 million viewers); evaluation feedback and requests for additional messages. **Intervention(s):** The Advisory Committee, composed of a multi-stakeholder group using evidence standards (Dietitians of Canada and PEN®; Alberta Health Services; Canada Research Chair in Food Marketing; a pediatrician and stakeholders across Canada), engaged a network of strategic alliances to establish: project partners, governance, administrative, operational, content and peer review processes; evaluation and dissemination plans; and funding. **Evaluation:** Using three methods: online surveys, targeted focus groups and video metrics. Phase 1: 35 videos and evaluation completed; disseminations underway.

Phase 2: 35 videos are in progress; completion January 2016.

**Results:** Evaluation of development and production processes (n=11) confirmed challenges of working under a tight timeline with multiple organizations and participants. Results of client (n=47) and provider (n=9) surveys and focus groups (n=16) revealed that respondents liked that the videos are short, practical, positive, used graphics well, and reinforced portrayal of diverse cultures, genders and families. Metrics statistics (Aug. 2015): 16,600 loads, 8,730 plays, in 80 countries. **Conclusions of authors and discussion:** Implications of online applications for delivery of health education are enormous. Preliminary feedback of Raising Our Healthy Kids videos supports this method of health education. Care provider feedback valued the short, evidence-based videos and their applicability to build capacity of parents and consumers felt the videos increased their confidence at providing a health-promoting environment to support their children developing healthy attitudes and behaviours.

**COMPETING INTERESTS:** While the videos were produced by Shadow Light Productions with principal funding from the Calgary Health Trust, and financial support for French translations provided by EatRight Ontario, the authors of this document can confirm there are no conflict of interests.

## O-020: BUILDING COMMUNITY CAPACITY TO SUPPORT HEALTHY EATING: AN EVALUATION OF THE NUTRITION SKILLS FOR LIFETM NUTRITION TRAINING PROGRAMME IN WALES

Lisa Williams<sup>1,\*</sup>

<sup>1</sup>Cardiff and Vale University Health Board, NHS Wales, UK.

\*Contact: Lisa.williams16@wales.nhs.uk

**Introduction:** Prevention of obesity and associated chronic conditions and prevention of malnutrition in older adults are public health priorities in Wales. Those living in the most deprived areas experience poorer diets, lower life expectancy and poorer general health. Action to reduce these inequalities in health is needed. **Objectives and target population:** 'Nutrition Skills for Life' is an All Wales programme which aims to build the capacity of communities to support healthy eating and prevent malnutrition. Dietitians provide nutrition training to enable community workers, volunteers and peer leaders to incorporate evidence based nutrition messages into their work, support more local people as community food workers and strengthen community food and nutrition action in areas of inequality. **Previous theories and investigations:** The

programme utilises an assets based community development approach. **Intervention(s):** Three accredited nutrition training packages were developed for community workers each targeting different priority groups of infants and children, adults and frail older adults. Nutrition and practical cooking skills courses were co-produced with community groups for trained community workers to deliver. **Evaluation:** Evaluation includes documentary analysis of standardized minimum data set templates, quantitative data from course evaluations and qualitative data from semi structured interview templates. **Results:** Between November 2006 and March 2015 over 37,000 people accessed the programme including 12,200 completing accredited training. 90% community course participants reported improving their diet. **Conclusions of authors and**

**discussion:** This standardized national programme efficiently and effectively engages with partners and communities to promote healthy eating and prevent malnutrition. It successfully supports people to take control over their health through improved nutrition knowledge and skills to make healthy food choices and improved food provision in community settings. It

represents an important capacity building strategy for public health nutrition and dietetics. Integrating this model into other national initiatives would result in far wider population reach.

**COMPETING INTERESTS:** The authors of this document can confirm there is no conflict of interests.

## O-022: DEVELOPING AN OBESITY SERVICES PLANNING FRAMEWORK FOR INTERPROFESSIONAL PRIMARY CARE IN CANADA

Paula Brauer<sup>1</sup>, Dawna Royall<sup>1\*</sup>, John Dwyer<sup>1</sup>, Tracy Hussey<sup>2</sup>, Nick Kates<sup>2</sup>, Heidi Smith<sup>3</sup>, Ross Kirkconnell<sup>3</sup>

<sup>1</sup>University of Guelph, Canada. <sup>2</sup>Hamilton Family Health Team, Hamilton, Canada. <sup>3</sup>Guelph Family Health Team, Guelph, Canada.

\*Contact: dawna.royall@dietitians.ca

**Introduction:** Effective lifestyle obesity prevention and treatment services are needed in primary care (PC), yet there are few tools to help teams plan what services should be provided. A planning framework was developed in one model of team-based PC, using a sequential process of provider and patient engagement, literature review and consensus development. **Methods:** Family Health Teams (FHTs, n=20), which were first introduced in 2005 in Ontario, Canada participated in development. Family physicians, nurses, dietitians, social workers and others work together to deliver care and diverse programs were already being offered at various FHTs. Focus groups were conducted with providers and patients from one large FHT, and transcripts were thematically analyzed to identify possible new services. Key health outcomes at different life-stages were identified, along with possible services for each life-stage, by 20 FHT teams using a moderated consensus process. A national panel of experts reviewed the draft. Finally, processes supported by evidence from a scoping review were incorporated into the planning framework.

**Results:** Participants identified many possible services under five categories: raising awareness, identification and initial management, follow-up management, expanded services, and practice initiatives. Strategies and desired outcomes were identified for five core life-stage groups: pregnancy to 2yrs, 3-12yrs, 13-18yrs, 18+yrs at health risk, and 18+ with complex care needs. Several activities deemed to be high priority by providers did not have research evidence to support them. Similarly, evidence suggested some strategies that were not mentioned by providers. **Conclusions, discussion and/or practical application:** This first planning tool has clarified key health goals at different stages in the lifespan, and indicated where evidence and provider perspectives converge and differ. Grounding the framework in practice proved useful for ensuring relevancy to practice. It may be a useful tool for guiding service planning and new implementation studies.

**COMPETING INTERESTS:** The authors of this document confirm there is no conflict of interest.

## O-023: DEVELOPMENT AND VALIDATION OF AN IODINE SPECIFIC FOOD FREQUENCY QUESTIONNAIRE TO ESTIMATE IODINE INTAKE IN AUSTRALIAN PREGNANT WOMEN

Dominique Condo<sup>1\*</sup>, Maria Makrides<sup>2</sup>, Sheila Skeaff<sup>3</sup>, Shao J Zhou<sup>4</sup>

<sup>1</sup>Women's and Children's Health Research Institute, University of Adelaide, Australia; School of exercise and Nutrition Sciences, Deakin University, Victoria, Australia. <sup>2</sup>Women's and Children's Health Research Institute, University of Adelaide, Australia; School of Paediatrics and Reproductive Health, University of Adelaide, Australia; South Australian Health and Medical Research Institute, Adelaide, Australia. <sup>3</sup>Department of Human Nutrition, University of Otago, Dunedin, New Zealand. <sup>4</sup>Women's & Children's Health Research Institute, University of Adelaide, Australia; School of Paediatrics and Reproductive Health, University of Adelaide, Australia; Foodplus Research Centre, School of Agriculture, Food & Wine, University of Adelaide.

\*Contact: dominique.condo@deakin.edu.au

**Introduction:** Adequate iodine is important during pregnancy to ensure optimal growth and development of the offspring. A dietary assessment tool to assess iodine intake and identify

inadequate intake in pregnancy would be useful. There is currently no validated assessment tool to measure iodine intake in Australian pregnant women. The aim of this study

was to develop and validate an iodine specific food frequency questionnaire (I-FFQ) for use in Australian pregnant women. **Methods:** A 44-item I-FFQ was developed to assess iodine intake from food and administered to 122 pregnant women at 28 weeks' gestation. Iodine supplement use was captured separately at 28 weeks gestation. Correlation and agreement between the I-FFQ and a four day weighed food record was assessed. Multiple regression analysis was used to assess the association between the I-FFQ and 24h urinary iodine excretion (UIE), 24h urinary iodine concentration (UIC), spot UIC and thyroid function at 28 weeks gestation. **Results:** A weak correlation was shown between the two dietary methods ( $r=0.349$ ,  $p<0.001$ ) which was strengthened with the addition of iodine supplements ( $r=0.876$ ,  $p<0.001$ ). There was a fair agreement ( $k=0.28$ ,  $p<0.001$ ) between the two

dietary measures in the classification of women as adequate ( $\geq 160\mu\text{g}/\text{day}$ ) or inadequate ( $<160\mu\text{g}/\text{day}$ ) for iodine intake from food, according to the Estimated Average Requirement (EAR), but the limits of agreement from the Bland-Altman plot were large. Total iodine intake was associated with 24h UIE ( $\beta=0.488$ ,  $p<0.001$ ) but not with spot UIC. Iodine intake from food using the I-FFQ was assessed at study entry ( $<20$  weeks gestation) in addition to 28 weeks gestation and there was a strong correlation at the two time points ( $r=0.622$ ,  $p<0.001$ ) indicating good reproducibility. **Conclusions, discussion and/or practical application:** In conclusion, the I-FFQ provides a valid tool to estimate iodine intake in pregnant women and can be used to screen women at risk of inadequate intake.

**COMPETING INTERESTS:** The authors of this document confirm there is no conflict of interest.

## O-024: DISCRETIONARY FOOD AND BEVERAGE CONSUMPTION AND ITS ASSOCIATION WITH BODY MASS INDEX AND WAIST CIRCUMFERENCE AMONG AUSTRALIAN ADULTS

Zhixian Sui<sup>1,\*</sup>, Weng Kei Wong<sup>1</sup>, Anna Rangan<sup>1</sup>

<sup>1</sup>School of Molecular Bioscience, Charles Perkins Centre, University of Sydney.

\*Contact: zhixian.sui@sydney.edu.au

**Introduction:** Consumption of discretionary foods and beverages has been linked with obesity. This study aimed to investigate current discretionary food and beverage consumption in Australia and its association with body mass index (BMI) and waist circumference (WC), including and excluding energy misreporters. **Methods:** This study utilized 24-hour recalls of 9,341 adults participating in the 2011-12 National Nutrition and Physical Activity Survey. Discretionary foods and beverages were categorised according to published criteria based on the Australian Dietary Guidelines. Multivariate regression models to examine the associations between discretionary food and beverage consumption (total and separately) and BMI or WC were undertaken, adjusted for age, gender, socio-economic status, and total energy intake. Analysis was undertaken for all respondents and after excluding under- and over-reporters of energy intake based on the Goldberg criteria. **Results:** The mean discretionary food and beverage consumption was 413g on the day surveyed (42% by weight from foods; 58% from beverages), providing 2386kJ of energy intake (88%

from foods; 12% from beverages). For all respondents, total discretionary food and beverage consumption was associated with higher BMI ( $P<0.01$ ), but not WC ( $P=0.07$ ). Consumption of discretionary foods alone (excluding beverages) was not associated with BMI or WC but discretionary beverages were associated with higher BMI ( $P<0.01$ ). After excluding under- and over-reporters, positive associations were found between total discretionary food and beverage consumption and BMI ( $P<0.01$ ) and WC ( $P<0.01$ ) as well as for discretionary foods alone ( $\beta=0.05$ ,  $p<0.01$  for BMI and  $\beta=0.01$  for WC,  $p<0.01$ ) and discretionary beverages ( $\beta=0.001$ ,  $p<0.01$  for BMI and  $\beta=0.03$ ,  $P<0.01$  for WC). **Conclusions, discussion and/or practical application:** Our findings showed total discretionary food and beverage consumption, as well as discretionary foods alone, and discretionary beverages alone were associated with BMI and WC in Australian adults. Consideration of the impact of energy misreporters in these analyses is important.

**COMPETING INTERESTS:** The authors of this document confirm there is no conflict of interest.



## O-025: EVALUATION OF NUTRITION-RELATED RISK FACTORS FOR OSTEOPOROSIS IN WOMEN BETWEEN 25-65 AGES

İsmail Mücahit Alptekin<sup>1\*</sup>, Eren Canbolat<sup>2</sup>, Funda Pınar Çakiroğlu<sup>1</sup>

<sup>1</sup>Ankara University, Faculty Of Health Sciences, Dept. Of Nutrition And Dietetics. <sup>2</sup>Ondokuz Mayıs University, Faculty Of Tourism, Department Of Gastronomy and Culinary Arts.

\*Contact: [mucahit.alptekin@ankara.edu.tr](mailto:mucahit.alptekin@ankara.edu.tr)

**Introduction:** Osteoporosis is a disease restricting physical activity, negatively affecting directly the quality of life of individuals, having high prevalence all over the world. In this study, the results of nutrition-related risk factors of osteoporosis in women were evaluated. **Methods:** 302 women age range of 25-65 were included in the study. Women's demographics were recorded and anthropometric measurements (height, weight, waist circumference) were measured. In order to evaluate the nutrition-related risk factors, food consumption records were taken with "24 hours recall method". Among these records, consumption of certain nutrients considered to be related to bone health (protein, calcium, magnesium, phosphorus) were calculated and compared with reference

values. **Results:** The mean age was 40,4±11,9; the average nutrient consumption were; calcium 617,6mg, protein 59,81g, magnesium 235,71mg, phosphorus 953,63mg. Considering recommended daily allows by age group, (25-30, 31-50, 51-65); while calcium and magnesium were consumed inadequate, protein and phosphorus consumption were found as sufficient in all age groups. Also smoking and drinking, which are another risk factors for osteoporosis, was found as 21.2% and 10.3%, respectively. **Conclusions:** For early diagnosis and/or treatment of osteoporosis, it is considered that regular monitoring of risk factors would be useful especially in women.

**COMPETING INTERESTS:** The authors of this document can confirm there is no conflict of interests.

## O-026: IS THERE A LINK BETWEEN TV VIEWING AND FOOD PREFERENCES IN ADOLESCENTS?

Ezgi Bellikci Koyu<sup>1\*</sup>, Kubra Isgin<sup>2</sup>, Reyhan Nergiz Unal<sup>2</sup>, Asli Akyol Mutlu<sup>2</sup>, Zehra Buyuktuncer<sup>2</sup>, Aylin Ayaz<sup>2</sup>, Halit Tanju Besler<sup>2</sup>

<sup>1</sup>Izmir Katip Celebi University, Faculty of Health Sciences, Department of Nutrition and Dietetics, Izmir, Turkey.

<sup>2</sup>Hacettepe University, Faculty of Health Sciences, Department of Nutrition and Dietetics, Ankara, Turkey.

\*Contact: [ezgi\\_bellikci@hotmail.com](mailto:ezgi_bellikci@hotmail.com)

**Introduction:** Increased number of hours spending on watching television (TV) and exposure on advertisements on TV is considered as one the factors of obesity. However, food consumption pattern during TV viewing is not well-known. This study aimed to investigate the relationship between TV viewing, exposure on advertisements and food consumption preferences of adolescents. **Methods:** A cross-sectional study was conducted with 2699 students (51.1% boy and 48.9% girl) aged 11-16, in Ankara, Turkey. A questionnaire on TV viewing, advertisement exposure and food consumption frequency was administrated, and anthropometric measurements were taken by dietitians. TV watching period was classified into two groups as adolescents watching TV 120 minutes/day according to recommendations of American Academy of Pediatrics. **Results:** The mean spending time for TV viewing was 142.6±88.7 minutes/day. The proportions of adolescents watching TV more than 120 minutes/day for girls and boys were 49.4% and 52.5%, respectively ( $p>0.05$ ). TV viewing period was not differed by body mass index in both genders. A tendency for

consuming food and beverage during TV viewing was obtained in the adolescents who watch TV more than 120 minutes ( $p<0.05$ ). **Conclusions:** The food consumption was increased with duration of watching TV. Mostly preferred foods during watching TV were fruits, chocolate/wafers and crisps. Apart from fruits, the food consumed during TV watching should be considered in terms of diet quality in adolescents.

**COMPETING INTERESTS:** The authors of this document can confirm there is no conflict of interests.



## O-028: NUTRITIONAL STATUS OF CHILDREN IN A REMOTE VILLAGE OF DESERT REGION THARPARKAR SINDH, PAKISTAN

Fayza Rani Khan<sup>1\*</sup>, Dr. Sina Aziz<sup>2</sup>, Maryyam Arif<sup>3</sup>

<sup>1</sup>The Kidney Centre Post Graduate Training Institute & Pakistan Nutrition and Dietetic Society (PNDS).

<sup>2</sup>Professor of Pediatrics, Abbassi Shaheed Hospital and Karachi Medical and Dental College, Pakistan.

<sup>3</sup>The Kidney Centre PGTI & Pakistan Nutrition and Dietetic Society (PNDS).

\*Contact: [khan.fayza@gmail.com](mailto:khan.fayza@gmail.com)

**Introduction:** Considering the increasing number of deaths at Tharparkar dessert region Sindh, a nutrition relief camp was planned to be set up at two remote villages named Haryar and Bhorilo to determine the prevalence of malnutrition among children (1 month–10 years) and its association with their living conditions. **Methods:** A cross sectional survey was conducted. Mothers with children aged 1 month to 10 years were invited to visit the camp. 200 children were screened for malnutrition using anthropometric measurements including height, weight and MUAC. Dietary intake data was collected from mother including information about feeding practices, vaccination, disease history, and living conditions. Data was analyzed through SPSS 17.Inc. **Results:** Out of 200 children 101(52.9%) were males and 90(47%) females. Mean age was 3.6±2.8 SD. Results showed that 42.4% (n=81) were severely malnourished (lower than 3<sup>rd</sup> percentile). Most of the children under five years n=79(51%) were found to be wasted (WHO diagnostic criteria for SAM) and had a z-score of -4 SD (for height & weight). The data demonstrated that

33.7% (n=32) children had mild malnutrition, 37.7% (n=58) suffered from moderate malnutrition and 15% (n=23) had severe malnutrition as per MUAC measurements. Food intake includes *roti* (Pakistani bread) and *chatni* (green chilies paste). There was no consumption of fruit, vegetable and milk due to no availability. Infants were breast fed and vaccinated but inappropriate and delayed weaning practices were reported by the mothers. Nearest medical facility/hospital was located at a distance of 15-30 miles. **Conclusions, discussion and/or practical application:** Major non nutrition related factors contributing towards malnutrition were lack of education, non-availability of food, drinking water and lack of employment opportunities. There should be a provision of basic health facilities at community level so that people do not have to travel to long distances for primary health issues. Health education and nutrition counselling and training of health care workers should be included in their basic health initiatives.

**COMPETING INTERESTS:** The authors of this document can confirm there is no conflict of interests.

## O-029: PERIOD TRENDS IN THE PREVALENCE OF HIGH AND LOW ENERGY DENSE-DIETS OF THE AUSTRALIAN POPULATIONS DIET BETWEEN 1995 AND 2011/12

Amanda Grech<sup>1\*</sup>, Anna Rangan<sup>1</sup>, Margaret Allman-Farinelli<sup>1</sup>

<sup>1</sup>School of Molecular Bioscience, Charles Perkins Centre, The University of Sydney, NSW, Australia.

\*Contact: [agre3682@uni.sydney.edu.au](mailto:agre3682@uni.sydney.edu.au)

**Introduction:** Energy-density (kg/g) has been shown to be associated with higher body mass index (BMI) and is frequently cited as a driver of the obesity epidemic. Little is known about the energy-density of the Australian population's diet. The aim of this research was to determine secular trends in the prevalence of high and low energy dense diets in the Australian population's diets. **Methods:** Secondary analysis of two nationally representative nutrition surveys from 1995 and 2011/12 was conducted for adults aged 18 and over. Energy-density was calculated as kJ/g for food. Individuals were categorized into tertiles of low (<6.0kJ/g), medium (6.0-8.0kJ/g) and high (>8.0 kJ/g) energy density. Prevalence estimates were age-standardized to the 2012 population. Means for each

tertile of energy-density were determined for BMI, total energy, percent energy contribution of fat, carbohydrate and protein for each sex separately and the total population. Significant differences were determined with ANOVA, controlling for age with PROC GLM in SAS. **Results:** The proportion of people with high energy dense diets has increased from 31.4% 1995 to 38.4% in 2011/12, while the proportion of people with low energy-dense diets has decreased from 30.1% in 1995 to 25.6% in 2011/12, and odds ratio (95% CI) of a low energy-dense diets in 2011/12 compared to 1995 was 1.27 (1.2-1.4). With increasing energy density, the mean percent energy from fat and total energy intake increased while, total fibre, weight of food and percent energy from carbohydrate and protein

decreased ( $P<0.001$ ). Mean BMI increased with higher energy density significantly for women and the total population ( $P<0.001$ ) but not men ( $P=0.09$ ). **Conclusions, discussion and/or practical application:** The energy-density of the Australian population's diets has increased between 1995 and 2011/12 and may be

an important target in preventive efforts against the obesity epidemic.

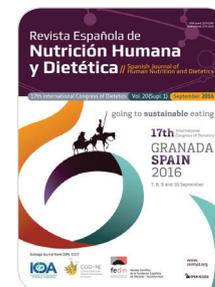
**COMPETING INTERESTS:** The authors of this document can confirm there is no conflict of interests.



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## ORAL COMMUNICATIONS



8 September 2016

FOOD AND SUSTAINABILITY

### O-036: EQUIPPING OUR FUTURE NUTRITION AND DIETETICS WORKFORCE WITH THE TOOLS TO MEND A BROKEN FOOD SYSTEM

Liza Barbour<sup>1,\*</sup>, Julia McCartan<sup>1</sup>, Evelyn Volders<sup>1</sup>, Claire Palermo<sup>1</sup>

<sup>1</sup>Monash University, Victoria, Australia.

\*Contact: [liza.barbour@monash.edu](mailto:liza.barbour@monash.edu)

**Introduction:** Internationally the food system is broken, creating irreversible environmental damage and increasing diet-related disease due to an intermittent supply of nutritious food. The origins and manifestations of an inefficient food supply are complex and improvements require multi-sectorial, innovative and evidence-based efforts. Dietitians and nutritionists are part of the solution, but need additional skills to support their practice. Until now, no tertiary-based learning opportunities specific to this complex issue exist for nutritionists or dietitians in Australia. This case study describes an innovative approach to build the capacity of Australia's future nutrition workforce to improve the food system. **Methods:** A single semester, undergraduate unit on 'food and the environment' was introduced at the study university. This unit explores the sustainability of our global and national food supply and its impact on public health. Learning outcomes for the unit ensure students understand the economic, social, political and environmental factors that drive and influence the food system. Students are exposed to

the views of food industry, economists, public health experts and food producers to explore a multitude of global initiatives which aim to mitigate environmental challenges, such as climate change, drought and salinity, as well as the impact of national policy decisions on the food system. Assessment against these learning outcomes is authentic and facilitates the opportunity for students to develop skills applicable for the workplace. **Results:** Evaluation of the unit is based on student satisfaction around the teaching and learning outcomes, as well as an assessment of student attitudes towards pursuing work in the field upon graduation and their self-perceived ability to implement theory into practice. **Conclusions, discussion and/or practical application:** With nutrition and dietetic practitioners graduating each year, this unit has the capacity to positively influence Australia's future workforce by equipping students with essential knowledge and skills to improve our global food system.

**COMPETING INTERESTS:** The authors of this document can confirm there is no conflict of interests.

## O-037: CONSUMERS' KNOWLEDGE ON SUSTAINABLE EATING, AND ITS ROLE IN FOOD PURCHASING BEHAVIOUR

Axel Stas<sup>1,\*</sup>, Anne Groen<sup>2</sup>, Jesús de la Rubia<sup>3</sup>, Mabon Negovec<sup>4</sup>

<sup>1</sup>Department of science and technology, Artesis Plantijn University College Antwerp, Belgium. <sup>2</sup>De Haagse Hogeschool, Den Haag, the Netherlands. <sup>3</sup>Dpto. Ciencias Farmacéuticas y de la Salud, Universidad San Pablo-CEU Madrid, Spain. <sup>4</sup>Institut Diätologie, FH Joanneum, Bad Gleichenberg, Austria.

\*Contact: koen.vanherle@ap.be

**Introduction:** A sustainable diet implies sufficient consumers' knowledge in order to purchase those food products that contribute to a sustainable environment. That knowledge could be assumed to be an important barrier to "eat" in a sustainable way, given the complexity of the definition of "sustainable eating" and the high variety of food products and production methods. Although determinants of sustainable food choices have been studied to a certain extent before, consumers' knowledge about sustainable eating hasn't been investigated thoroughly yet, and questionnaires to measure this knowledge can't be found in the literature. Although food purchases highly depend on "points of purchase" decisions, those consumers with a high sustainability awareness and knowledge might be hypothesized to buy sustainable food on a long term. **Methods:** To assess consumers' knowledge on sustainable eating, a questionnaire was developed based on sustainability terminology, dietary habits and food production practices in four countries (Austria, Belgium, the Netherlands and Spain). Information on purchasing behavior and intentions

to buy and eat in a sustainable way were included in the questionnaire. Socio-demographic variables were included to obtain representative samples of the general population. **Results:** This questionnaire will be distributed among consumers in a cross-section of the four different countries, aiming for a total of 200 respondents. The study period will be in February 2015. Descriptive statistics will be generated for individual questions and the overall questionnaire outcome, whereas the influence of certain socio-demographics as age, gender and educational level will be analyzed. These results will be ready for presentation by July 2016. **Conclusions:** This research will give insight in consumers' knowledge on sustainable eating and its influential factors. Furthermore, the relation with sustainable eating on a long term will be investigated and guidelines for nutrition professionals will be given to favor sustainable eating of consumers by increasing their conceptual knowledge.

**COMPETING INTERESTS:** The authors of this document can confirm there is no conflict of interests.

## O-038: A STUDY ON THE FOOD PLATE WASTE BY PATIENTS IN A PRIVATE HOSPITAL SET-UP; IS IT SUSTAINABLE IN THE LONG RUN

Minal Gujarathi<sup>1,\*</sup>, Dr. Rita Bhargava<sup>2</sup>

<sup>1</sup>Visiting faculty PGTD, Rashtrasant Tukdoji Maharaj Nagpur University, Nagpur, India. <sup>2</sup>Chief Dietitian, Care Hospital, The Institute of Medical Sciences, Nagpur, India.

\*Contact: chotu28@hotmail.com

**Introduction:** In a developing country like India where many are malnourished food waste is of great concern for the progress of the nation. Anorexia, nausea, pain, stress, personal food habits, cultural diversity few of the reasons for food plate waste in a hospital environment. The objective of the study is to calculate and assess the sustainability and economic viability. **Methods:** In a 110 bedded private multi-specialty hospital with a full working kitchen for 30 days. Portion size was standardized. **Results:** On an average in a period of 30 days, 930 food plates of full diet and 570 plates of semi-solid diet were served to the patients. An entire day meal per patient comprised of 1,050g of a full cooked meal while a semi-solid meal was 750 grams. Daily mean of 31±10 full diet, 19±6 semi-solid diets was served; minimum 42, maximum 67 patients were consuming meals from the hospital rest were either on

liquids, Ryles tube or Nil by mouth. Quantity by weight served was 46,800g per day to the patients taking semi-solid or full meals, includes breakfast, lunch, snacks, dinner. In a month the mean quantity of food served was 1,404kg and plate waste was 135kg. The mean food waste calculated was 4,516g per day, i.e. 9.65% of the food served. 61.52% patients consumed the entire meal served, 15.38% patients had 75% and 23.10% of the patients had 50% of meal served. **Conclusions, discussion and/or practical application:** A significant quantity 9.65% of food plate waste was observed in the study that can be substantially reduced by strategic planning. This is need of the hour as more than half the population of 1.3 billion people stay below the poverty line.

**COMPETING INTERESTS:** The authors of this document can confirm there is no conflict of interests.

## O-039: AN ATTITUDINAL ANALYSIS OF GREEN CONSUMERS IN TURKEY

Aslihan Ozdemir<sup>1</sup>, Elif Inan-Eroglu<sup>1</sup>, Berna Madali<sup>1</sup>, Derya Dikmen<sup>1,\*</sup>

<sup>1</sup>Hacettepe University Faculty of Health Sciences Nutrition and Dietetics Department Ankara, Turkey.

\*Contact: ddikmen@hacettepe.edu.tr

**Introduction:** Assessment of the consumer decision making process is very complex in terms of green consumption. Over the last few decades there is a wide-spread environmental concern which makes consumers purchases of environmentally safe goods and services more important to analyze the influences and decision making. This study has been planned with the object of analyzing Turkish green consumers' attitudes.

**Methods:** In order to analyze consumers' attitudes towards pesticides, we undertook an attitudinal questionnaire. For determining consumers' attitudes, the questionnaire consists of five parts including genetically modified foods, irradiated foods, food additives, colouring agents, hormones and antibiotics. Consumers indicated their opinions on a 4-point scale. Questions on socio-demographic characteristics were also included. This cross sectional study conducted in a random selected sample consisted of 820 consumers (50.9% woman,

49.1% man) in Ankara. The questionnaires were analyzed with the statistical programme SPSS. **Results:** Participants were categorized according to their healthy nutrition habits and ecologically friendly behaviors. Compare to unhealthy eaters, It has been shown that consuming genetically modified foods, irradiated foods, food additives, colouring agents, hormones and antibiotics regularly are more risky to healthy eaters ( $p < 0.05$ ). Participants who claimed themselves as eco-friendly were pay attention to consuming genetically modified foods, irradiated foods, food additives, colouring agents, hormones and antibiotics regularly when purchasing food compare to non eco-friendly participants ( $p < 0.05$ ). **Conclusion:** Analysing green consumers' attitudes is important to determine the influences and decision making process.

**COMPETING INTERESTS:** The authors of this document can confirm there is no conflict of interests.

## O-040: CONSUMERS' FOOD CONSUMPTION CHOICES TOWARDS ENVIRONMENTAL PROTECTION

Elif Inan-Eroglu<sup>1</sup>, Aslihan Ozdemir<sup>1</sup>, Berna Madali<sup>1</sup>, Derya Dikmen<sup>1,\*</sup>

<sup>1</sup>Hacettepe University Faculty of Health Sciences Nutrition and Dietetics Department Ankara, Turkey.

\*Contact: ddikmen@hacettepe.edu.tr

**Introduction:** The concept of sustainability has been drawing attention over the past few years. As consumers have a major role in making food chains more sustainable the aim of this study was to determine of consumers' food consumption choices towards environmental protection. **Methods:** In order to determine consumers' attitudes towards environmental protection, the questionnaire consists of 14 questions about environmental protection, environmental problems, eco-friendly production, social responsibility, recycling, government policies and limited natural sources. Questions on socio-demographic characteristics were also included. Consumers indicated their level of agreement on a 5-point scale. The sample comprised 417 women and 403 men, ranged from 18 to 64 years. The questionnaires were analyzed with the statistical programme SPSS. **Results:** Participants were categorized according to their healthy nutrition habits and ecologically friendly behaviors. Compare to unhealthy eaters, It has been shown that environmental protection, recycling, establishing policies and protection of limited natural sources are more important to healthy eaters ( $p < 0.05$ ). Healthy eaters

also indicated that social responsibility makes differences when it comes to environmental protection ( $p < 0.05$ ). Participants who claimed themselves as eco-friendly were pay more attention to environmental protection, recycling, establishing policies and protection of limited natural sources ( $p < 0.05$ ). **Conclusion:** Since sustainability has been drawing attention, determination of consumers' food consumption choices towards environmental protection is very important.

**COMPETING INTERESTS:** The authors of this document can confirm there is no conflict of interests.



## O-041: INCLUDING SUSTAINABILITY PRINCIPLES INTO THE ATHLETE'S PLATE NUTRITIONAL EDUCATIONAL TOOL

Alba Reguant-Closa<sup>1,\*</sup>, Ashley Judson<sup>2</sup>, Margaret Harris<sup>3</sup>, Nanna Meyer<sup>3</sup>, Terri Moreman<sup>2</sup>

<sup>1</sup> Universitat d'Andorra. <sup>2</sup> Food and Nutrition Services and Sports Performance, United States Olympic Training Center, Colorado Springs. <sup>3</sup> Beth-El College of Nursing and Health Sciences, Department of Health Sciences, University of Colorado, Colorado Springs.

\*Contact: [albareguantclosa@gmail.com](mailto:albareguantclosa@gmail.com)

**Introduction:** The Athlete's Plate (AP) is a nutrition education tool developed by sport dietitians to educate athletes on how to design their plates depending on training volume and intensity. The previous validation of the AP resulted in higher protein content than recommended for athletes. Due to the high impact of protein (especially from animals) on the environment (e.g., GHGE, land), the purpose of this study was to: 1) evaluate protein quantity and quality per plate and day to identify where overemphasis of protein occurred by sport dietitians; 2) develop nutritional approaches that may be feasible in helping athletes meet but not exceed protein recommendations (especially considering plant versus animal sources) and 3) develop a framework integrating performance, health and environmental impacts regarding protein intakes in active individuals. **Methods:** Nutritional content of 216 plates created by 12 Registered Dietitians were evaluated from the previous validation of the AP. Food content of each plate was assessed to obtain grams of protein of each food group using Computation Software (Hospitality Suite, v. 18.1, Chatsworth,

California). Pursuing an environmental impact reduction of the plates, protein content of each plate was reduced or substituted using current guidelines in the literature. Dietary recommendations for health and performance were also considered when modifying the plates. **Results:** Results showed protein originated from a variety of sources but animal were more dominant over plant sources. Several approaches, including plant-based AP, will be presented along with a framework highlighting the link between performance, health and environmental impact of protein in active individuals. **Conclusions, discussion and/or practical application:** The AP, as currently available, promotes high protein intakes which is not sustainable. In order to meet guidelines for performance, health and sustainability, AP will need to be adjusted using a framework for education that helps both professionals and their active clients to better understand environmental impacts of their food choices.

**COMPETING INTERESTS:** The authors of this document can confirm there is no conflict of interests.

## O-042: THE SURVEY ON EDIBLE INSECTS FOR EMERGENCY FOOD IN PREPARATION FOR THE SUSTAINABLE SOCIETY

Kinya Matsui<sup>1,\*</sup>, Yuki Takamatsu<sup>2</sup>, Ryota Mitsuahai<sup>2</sup>, Hiroshi Mizuno<sup>2</sup>, Sho-ichi Uchiyama<sup>2</sup>, Shinjiro Saeki<sup>2</sup>, Minoru Ishibushi<sup>3</sup>

<sup>1</sup> Osaka Kyoiku University Graduate School. <sup>2</sup> Edible insect Science Meeting. <sup>3</sup> Kyoto College Nutritional & Medical Sciences.

\*Contact: [kinya.matsui@email.plala.or.jp](mailto:kinya.matsui@email.plala.or.jp)

The Great East Japan Earthquake, we found that the residents of an area devastated by the disaster were eating mostly carbohydrates and not enough protein or vitamins. We find a report in seeking for ways to improve the bias of nutrition for prolonged disaster life, in May 2013, the Food and Agriculture Organization of the United Nations (FAO) released a report recommending the use of insects to address the future problem of global food shortage. Many insects are high in protein, contain high-quality unsaturated fats, and have an abundance of calcium, iron, zinc and other minerals. Therefore, we carried out a questionnaire with dietitians who are members of the Osaka Dietetic Association (n=130) and student dietitian training school (n=124). The subjects were asked about their experience of eating insects (4 items) and impressions thereof (22 items), in order to confirm the acceptance posture against

edible insects. The results showed that only 27.2% said that they "want to eat (insects) again, or want to try eating them", indicating that eating insects made them "feel sick and uncomfortable". However, some insects have high nutritional value and are useful as food ingredients. If such insects are processed so that they can be stored for extended periods in preparation for long-term disasters, they could be used as well-balanced emergency food. I would like to improve the negative image of insects as food and make edible insects more the sustainable society edible insect was prolonged to support nutritional is, we believe that it is important to be actively used in everyday menus.

**COMPETING INTERESTS:** There is no profit reciprocity. The authors of this document can confirm there is no conflict of interests.



8 September 2016

## CLINICAL NUTRITION AND DIET THERAPY

### O-015: THE EFFECT OF CAFFEINE OUT OF COFFEE ON RESTING METABOLIC RATE OVER TIME

Maartje de Groot<sup>1\*</sup>, Lenny Gribnau<sup>1</sup>, Kim Groothuis<sup>1</sup>, Dorien Voskuil<sup>1</sup>, Jacqueline Langius<sup>1</sup>

<sup>1</sup>The Hague University of Applied Sciences, Faculty of Health, Nutrition & Sport, Dept. of Nutrition & Dietetics, The Hague, The Netherlands.

\*Contact: [m.h.degroot@hhs.nl](mailto:m.h.degroot@hhs.nl)

**Introduction:** In dietetic practice, clients' energy requirements can be easily determined by measuring the resting metabolic rate (RMR) using indirect calorimetry. For reliable measurements, clients need to be fasting and may not have used any stimulants, such as caffeine out of coffee, since this might influence the RMR. Experts experienced that strict compliance to these conditions may be hard for clients, since early coffee consumption may be part of their daily habits. Therefore, it was aimed to investigate the effect of caffeine out of two different types of coffee on RMR in healthy subjects in order to evaluate whether the measured RMR after coffee consumption is still usable in dietetic practice. **Methods:** Among 10 healthy subjects (70% female; aged 21.6±4.2yrs) RMR was measured by a portable indirect calorimeter (FitMateRMR, CosMed) on two separate test days in fasting state, and 0.5, 1.5, 2.5, and 3.5hrs after coffee consumption. On each test day, one of the coffee

samples was randomly provided to the participant: fine grid Arabica coffee beans prepared by French Press (S1), or Instant Coffee (S2). Differences in the effect of both coffee samples on RMR over time were tested using repeated measures ANOVA.

**Results:** For both coffee samples, effects of caffeine out of coffee on RMR were statistically significant over time ( $p=0.01$ ). For S1 and S2, respectively, there was a mean increase of RMR at 0.5hrs of 6% vs. 2%, at 1.5hrs 7% vs. 4%, at 2.5hrs 5% vs. 7%, and at 3.5hrs 10% vs. 4%. There was no difference between the two samples ( $p=0.70$ ). These are preliminary results; results of the full data set are presented at the conference. **Conclusion:** It can be concluded that consumption of one cup of coffee in the morning influences the RMR significantly. Thus, measuring RMR after coffee consumption is not reliable in dietetic practice.

**COMPETING INTERESTS:** The authors of this document can confirm there is no conflict of interests.

### O-016: EFFECT OF A 1-YEAR WALNUT SUPPLEMENTATION ON BLOOD LIPIDS AMONG OLDER INDIVIDUALS: FINDINGS FROM THE WALNUTS IN HEALTHY AGING (WAHA) STUDY

Tania-Marisa Freitas-Simoes<sup>1\*</sup>, Mercè Serra-Mir<sup>1</sup>, Irene Roth<sup>1</sup>, Aleix Sala-Vila<sup>1</sup>, Sujatha Rajaram<sup>2</sup>, Joan Sabaté<sup>2</sup>, Emilio Ros<sup>1</sup>

<sup>1</sup>Lipid Clinic, Endocrinology and Nutrition Service, Hospital Clinic, Barcelona, Spain.

<sup>2</sup>School of Public Health, Loma Linda University, Loma Linda, CA.

\*Contact: [freita@clinic.ub.es](mailto:freita@clinic.ub.es)

**Introduction:** Evidence from small, short-term clinical trials in middle-aged adults indicates a cholesterol-lowering effect of nut-supplemented diets. However, there are no large, long-

term, nut feeding studies in older populations. We hypothesized that long-term walnut consumption would improve the lipid profile without weight gain in healthy Spanish elders. **Methods:**

This is a sub-study of the dual-center (Barcelona, Spain and Loma Linda, California) WAHA trial, aimed at assessing the effects of a 2-year walnut supplementation on age-related health outcomes in 706 individuals 63 to 79 years-old. In Barcelona we randomized 352 participants (69% women) to either supplementing their usual diet with walnuts at  $\approx 15\%$  of energy (30-60g/d) [walnut group (WG)] or maintaining usual diet [control group (CG)]. We measured serum lipids, body weight and waist circumference at baseline and 1 year. In a subset (n=140) we determined the  $\alpha$ -linolenic acid (ALA) proportion in red blood cell (RBC) membranes to assess adherence to walnuts. We assessed the effect of intervention on adiposity and serum lipids by ANCOVA adjusting for sex, age, and baseline values. Lipid changes were additionally adjusted for in-trial changes in statin treatment. **Results:** There were 18 dropouts post-randomization, thus full data were available for 334 participants (n=166 WG). The walnut diet was well tolerated. RBC ALA increased in the WG by 0.28% (95% CI

[0.24 to 0.31];  $P < 0.001$  versus CG). At 1 year, WG participants decreased mean total- and LDL-cholesterol from baseline (-8.84mg/dL [-12.74 to -4.94]; -8.53mg/dL [-12.07 to -5.00], respectively), translating into significant differences versus changes in CG (-1.68mg/dL [-5.59 to 2.23]; -1.88mg/dL, [-5.44 to -1.68]). No changes were observed in other lipids, weight or waist circumference. **Conclusions, discussion and/or practical application:** Incorporating walnuts into the habitual diet of healthy elders for 1 year was well tolerated and improved the lipid profile without changes in adiposity.

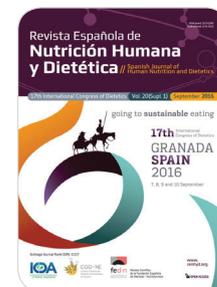
**COMPETING INTERESTS:** Joan Sabaté and Emilio Ros have received research funding through their institutions from the California Walnut Commission and are non-paid member of its scientific advisory committee. No other authors declare a conflict of interest. Support or Funding Information. The WAHA study is funded by the California Walnut Commission. Walnuts in Healthy Aging (WAHA) trial (<https://clinicaltrials.gov/ct2/show/NCT01634841>).



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## ORAL COMMUNICATIONS



8 September 2016

COMMUNITY NUTRITION AND PUBLIC HEALTH

### O-030: PREDICTORS OF PARENTAL DISCRETIONARY FOOD CHOICES PROVISION USING THE HEALTH ACTION PROCESS APPROACH FRAMEWORK: DEVELOPMENT AND VALIDATION OF A SELF-REPORTED QUESTIONNAIRE FOR PARENTS OF 4-8 YEAR OLDS

Brittany Johnson<sup>1,\*</sup>, Dorota Zarnowiecki<sup>1</sup>, Gilly Hendrie<sup>2</sup>, Rebecca Golley<sup>1</sup>

<sup>1</sup>Division of Health Sciences, Sansom Institute for Health Research, University of South Australia, North Terrace, Adelaide, South Australia, Australia. <sup>2</sup>Commonwealth Scientific Industrial Research Organization Food and Nutrition Flagship, North Terrace, Adelaide, South Australia, Australia.

\*Contact: [brittany.jayne.johnson@gmail.com](mailto:brittany.jayne.johnson@gmail.com)

**Introduction:** Globally children's intake of discretionary choices (unhealthy foods) is excessive. Parents' attitudes and beliefs towards the provision of discretionary choices provide a promising new avenue to target reductions in children's intake of these foods. The aim of this study was to develop and validate a tool to measure parents' attitudes and beliefs towards limiting discretionary choices, using the Health Action Process Approach (HAPA), a socio-cognitive model. **Methods:** This study was undertaken in two stages. The first stage included development and content validation (expert panel n=5, parent pre-test n=4) of a questionnaire based on the HAPA model. The HAPA model consists of 2 phases (motivational and volitional) and includes constructs of risk perception, outcome expectancies, self-efficacy and planning for behaviour change. Stage two involved 162 parents self-completing the questionnaire online, and analyses run to determine the construct and predictive validity of the HAPA-based questionnaire. **Results:** The expert panel and parent pre-test resulted in only minimal revisions to the draft HAPA-based questionnaire, indicating appropriate content validity

of the newly developed tool. Principal component analyses resulted in fourteen factors, containing seven subscales measuring each the motivational phase constructs and seven subscales measuring the volitional phase constructs within the HAPA model. Internal consistencies were high for all subscales (Cronbach's alpha 0.77–0.92). Predictive validation revealed parent self-efficacy as the strongest independent predictor of intention to limit provision of discretionary choices (action self-efficacy  $\beta$  0.319). **Conclusions, discussion and/or practical application:** Self-efficacy as a predictor of parent behaviour is consistent with previous study findings. The newly developed HAPA-based questionnaire can be used to gain greater insight into parents' ability to limit discretionary choices, and to explore parents' attitudes and beliefs which may in future facilitate the development of appropriate large-scale public health nutrition interventions to positively impact children's intake of discretionary choices in the home.

**COMPETING INTERESTS:** The authors of this document can confirm there is no conflict of interests.

## O-031: RESULTS OF A PILOT STUDY DEMONSTRATE THE VALIDITY AND RELIABILITY OF A NOVEL, ELECTRONIC NUTRITION SCREENING TOOL FOR ADULTS WITH LEARNING DISABILITY

Nicky Walker<sup>1,\*</sup>, Nicola Reeve<sup>1</sup>, Janet Gill<sup>2</sup>, Steven Gill

<sup>1</sup>Coventry University. <sup>2</sup>South Warwickshire NHS Foundation Trust.

\*Contact: [aa6623@coventry.ac.uk](mailto:aa6623@coventry.ac.uk)

**Introduction:** Adults with a learning disability (LD) have a higher prevalence of nutrition-related ill health, under and over weight than the general population (Emerson *et al.* 2012). They should therefore receive nutrition screening to identify nutritional problems (IASSID n.d.). There is presently no nutrition screening tool (NST) which identifies under and over nutrition, is suitable for use in adults with LD in a range of care settings and is accompanied by a concise, robust action plan. The aims of this study were to investigate the reliability and validity of a novel electronic NST (ENST) for adults with LD, designed to screen for both over and under nutrition. **Methods:** 31 adult participants with LD were recruited. Mental Health Act (2005) guidelines were followed regarding adults lacking capacity to consent and ethical approval was received. A registered dietitian assessed participants' nutritional status and participants were each screened by 3 different screeners using the ENST. Assessment and screening results were compared to investigate concurrent

criterion validity. Inter-rater reliability was investigated through comparison of the 3 screening results for each participant. **Results:** Very good agreement between nutritional assessment and screening tool was demonstrated in categorization of under nutrition risk ( $\kappa=0.80$ ) and over nutrition risk ( $\kappa=0.75$ ), indicating the ENST to have very good validity. Very good inter-rater reliability was shown in screening for both under nutrition (ICC 0.87,  $\kappa=0.80$ ) and over nutrition (ICC 0.82,  $\kappa=0.95$ ). All results were significant. **Conclusions, discussion and/or practical application:** Very good inter-rater reliability and concurrent criterion validity were demonstrated by the ENST; results compare favourably to other published NSTs (e.g. Bryan, Jones, Russell 1998, Weekes, Elia, Emery 2004, Kyle *et al.* 2006). Due to the small sample size of this pilot study, a larger study investigating performance across categories of LD is indicated.

**COMPETING INTERESTS:** The authors of this document can confirm there is no conflict of interest.

## O-032: SWEDISH CHILDREN'S ENERGY AND NUTRIENT INTAKE FROM SCHOOL MEALS

Christine Persson Osowski<sup>1,\*</sup>, Anna Karin Lindroos<sup>2</sup>, Heléne Enghardt Barbieri<sup>2</sup>, Wulf Becker<sup>2</sup>

<sup>1</sup>Department of Food, Nutrition and Dietetics, Uppsala University. <sup>2</sup>National Food Agency.

\*Contact: [christine.persson-osowski@ikv.uu.se](mailto:christine.persson-osowski@ikv.uu.se)

**Introduction:** In Sweden, school meals constitute a welfare service and an important part of public health work. According to Swedish law, school meals served in compulsory school must be served for free and be nutritious, i.e. reach the reference values based on the Nordic Nutrition Recommendations. Up to now, it was unknown if children received the energy and nutrients intended from school meals. The present study aimed to describe children's energy and nutrient intake from school meals and compare this to the Swedish reference values. **Methods:** The study is based on a national food survey, which included school meal data, consisting of a pilot-tested food diary and questionnaire performed by the National Food Agency in 2003. 1840 children attending grade 2 (mean age 8.6) and grade 5 (mean age 11.7) were included. Their intake was compared to the Swedish reference values for energy and nutrients. **Results:** The children received close to or above 30% of their daily energy and nutrient intake from school meals. The intake of saturated fatty acids and sodium exceeded

the reference values and the reference values for energy, carbohydrates, dietary fibre, polyunsaturated fatty acids, vitamin D and vitamin E were not met in both age groups. When standardized for energy, the result for carbohydrates was not significant. The children in grade 5 did not reach the reference values for folate, potassium, calcium, magnesium, iron, selenium and zinc, but these results were not significant when standardized for energy. **Conclusions, discussion and/or practical application:** The children received about 30% of their energy and nutrient intake from school meals, but there is room for improvement, especially regarding quality of fat, dietary fibre, sodium, vitamin D and iron. Some of the results may be due to the children consuming less energy than intended, the children not having all components of the meal or underreporting.

**COMPETING INTERESTS:** The authors of this document can confirm there is no conflict of interests.



8 September 2016

## INNOVATION IN FOOD, NUTRITION AND DIETETICS

### O-044: DIETETIC NUTRITIONAL PRESCRIBING PROJECT THAT DELIVERS IMPROVED QUALITY OF CARE, APPROPRIATE PRESCRIBING, & POUND; 400,000 INVESTMENT INTO DIETETICS AND A YEARLY SAVING OF & POUND; 816,000 FOR COMMISSIONERS

Sri Kakarlapudi<sup>1\*</sup>, Carrie Morgan<sup>2</sup>, Stuart Lakin<sup>3</sup>

<sup>1</sup>Clinical Lead for Nutrition and Dietetics, Rotherham NHS Foundation Trust, Rotherham, UK. <sup>2</sup>Nutritional Prescribing Lead, Rotherham NHS Foundation Trust, Rotherham, UK. <sup>3</sup>Head of Medicines Management, Rotherham Clinical Commissioning Group, Rotherham, UK.

\*Contact: sri.kakarlapudi@rothgen.nhs.uk

**Introduction:** The Medicines Management team from the local Clinical Commissioning Group (CCG) identified dietitians as alternative prescribers for nutritional products in place of General Practitioners (GPs). Prescribing and budgetary responsibility was granted to Rotherham Nutrition and Dietetic Services (RNDS) for Oral Nutritional Supplements (ONS), Enteral Tube Feeds, Gluten-Free Foods and Specialist Nutritional Products. **Objectives and target population:** Provide high quality nutritional prescribing services to the 257,600 Rotherham population. Extend the role of dietitians to become nutritional prescribers. Reduce total spend on nutritional products through appropriate prescribing. Reduce GP workload. **Previous theories and investigations:** It was hypothesized that the high levels of expenditure could be due to some inappropriate prescribing by GPs. **Intervention(s):** Dietitians undertook a review of nutritional prescriptions in Rotherham which led to 280 out of 757 ONS prescriptions being identified as inappropriate and discontinued. Evidence based pathways and criteria were developed. All patients requiring nutrition support were seen by dietitians and

prescriptions issued where required. Innovative contracting for product supply. **Evaluation:** Performance was monitored using: patient activity, access times, incidents, patient satisfaction, product use and expenditure. **Results:** Improved quality of care for patients with reduced access times and 100% patients receiving dietetic support. Effective management of nutritional prescribing reduced ONS spend by 27%, while national spend increased by 103%. Delivered yearly savings >£1,200,000. £400,000 of which invested in dietetics. High Patient satisfaction. **Conclusions of authors and discussion:** At a time when funding is very challenging, RNDS in partnership with commissioners have created a unique dietetic led nutritional prescribing service, nationally referred to as the 'Rotherham Model'. The project has improved patient care, facilitated the expansion of dietetic services, raised profile of dietitians and delivered yearly £816,000 savings for the CCG. Opportunities for future development of the service continue to be explored.

**COMPETING INTERESTS:** The authors can declare there is no conflict of interests.

### O-045: INNOVATIVE BISCUITS FOR A BETTER TOLERANCE TO CARBOHYDRATES

Nuria Martinez-Saez<sup>1\*</sup>, María D. del Castillo<sup>2</sup>, María A. Martín-Cabrejas<sup>2</sup>

<sup>1</sup>CIAL, Food Science Research Institute (CSIC-UAM), Madrid, Spain. <sup>2</sup>CIAL, Food Science Research Institute (CSIC-UAM), Madrid, Spain.

\*Contact: nuria.m.s@cial.uam-csic.es

**Introduction:** The prevalence of type 2 diabetes is rising exponentially and estimated diabetic population to reach over 300 million cases by year 2030. Interest in healthier foods including stevia as sugar replacer and  $\alpha$ -glucosidase inhibitors with potential to reduce diabetes has increased. This research aims to develop innovative biscuits to improve

carbohydrates tolerance. **Methods:** Biscuits were prepared using as basic ingredients wheat flour and sunflower oil. Egg was not incorporated and sucrose was replaced by Stevia as natural hypocaloric sweetener. Spent coffee grounds (SCG) were included as antioxidant insoluble dietary fibre and FOS as enhancer of glucose tolerance, gut microbiota (prebiotic),

texture and taste. Novel biscuits, biscuits made according to traditional recipe and SCG were digested by mimicking human conditions. Bioaccessibility of nutrients and bioactive compounds in biscuits and SCG were estimated by analysis of total carbohydrates, glycaemic sugars, overall antioxidant capacity, total phenolic compounds, proteins, free amino groups and galactomannans. Effect of digests on intestinal  $\alpha$ -glucosidase activity was determined in order to evaluate the impact of bioaccessible compounds on glucose tolerance as measurement of their antidiabetic effect. **Results:** Innovative biscuits inhibited  $\alpha$ -glucosidase activity in 81%. The observed

effect is equivalent to that caused by 710 $\mu$ g/mL of acarbose. Inhibition induced by digests of traditional biscuits was significantly lower ( $p < 0.05$ ) than that found for reformulated biscuits. **Conclusions, discussion and/or practical application:** A new healthier biscuit formulation for improving tolerance to carbohydrates was developed. Stevia, phenols, proteins, bioactive peptides and galactomannans might contribute to inhibitory effect. Further studies are required to quantify the contribution of each ingredient to the overall effect.

**COMPETING INTERESTS:** The authors declare that there are no conflicts of interest.



8 September 2016

## FEEDING IN EMERGENCY SITUATION

### O-034: IMPROVEMENT FACTOR OF THE DIET IN EMERGENCY SHELTERS AFTER THE GREAT EAST JAPAN EARTHQUAKE

Moeka Harada<sup>1\*</sup>, Nobuyo Tsuboyama-Kasaoka<sup>2</sup>, Asuka Takizawa<sup>3</sup>, Jun Oka<sup>3</sup>, Hidemi Takimoto<sup>2</sup>

<sup>1</sup>Department of Nutritional Epidemiology, National Institute of Health and Nutrition, Tokyo, Japan. Tokyo Kasei University, Tokyo, Japan. <sup>2</sup>Department of Nutritional Epidemiology, National Institute of Health and Nutrition, Tokyo, Japan. <sup>3</sup>Tokyo Kasei University, Tokyo, Japan.

\*Contact: [g150909@tokyo-kasei.ac.jp](mailto:g150909@tokyo-kasei.ac.jp)

**Introduction:** The Great East Japan Earthquake that occurred on March 11, 2011 caused damages in wide areas. Therefore, the deterioration of dietary condition was serious. The purpose of this study is to clarify the dietary condition in the emergency shelters and to examine the improvement factor of the diet. **Methods:** To examine the provision amount of dietary energy and nutrients (n=133), the diet providing system (the frequency of meals per day, the frequency of mass feeding per day and menu creators) and menus (n=260), we reanalyzed the data obtained from the survey at the emergency shelters by Miyagi prefectural government about one month after the earthquake. We classified menus into five groups: staple foods, main dishes, side dishes, dairy products and fruits, and then counted the providing frequency. **Results:** The average amount of provided diet was 1658kcal (energy), 47.8g (protein), 0.72mg (vitamin B<sub>1</sub>), 0.82mg (vitamin B<sub>2</sub>) and 32.0mg (vitamin C), respectively. The "Nutritional Reference Values for Dietary Assessments and Planning for the Provision of Meals to Emergency Shelter" weren't filled at many shelters. When

the provision frequency of meals increased, the provision frequency of the 5 groups (staple foods, main dishes, side dishes, dairy products and fruits) didn't markedly increase; however, the average provision amount of dietary energy and all nutrients significantly increased. When the frequency of mass feeding increased, the provision frequency of the 3 groups (staple foods, side dishes and fruits) significantly increased. Considering nutrients, the average provision amount of vitamin C significantly increased. Furthermore, in the emergency shelters where registered dietitians and general dietitians created menus, the provision frequency of the 2 groups (dairy products and fruits) significantly increased; however, considering nutrients, significant difference wasn't detected. **Discussion:** To improve the dietary condition, it's desirable that the frequency of mass feeding increases and nutrition professionals create menus.

**COMPETING INTERESTS:** The authors of this document can confirm there is no conflict of interests.

## O-035: MAKING RECIPES OF SURVIVAL FOOD IN FOOD SERVICE PRACTICUM OF UNIVERSITY DIETITIAN COURSE

Ikuko Shimada<sup>1\*</sup>, Satoshi Numata<sup>1</sup>, Tomoko Hirouchi<sup>1</sup>, Mamoru Tanaka<sup>1</sup>, Chie Tokuhiro<sup>2</sup>, Keiko Watanabe<sup>3</sup>, Takeaki Okamoto<sup>4</sup>

<sup>1</sup> University of Kochi. <sup>2</sup> Kochi prefecture Aki Health and Welfare Centre. <sup>3</sup> Kochi Health Sciences Centre. <sup>4</sup> Ehime University.

\*Contact: shimada@cc.u-kochi.ac.jp

**Introduction:** After the great earthquake in Tohoku, Japan, 2011, the demand for dietitian who can instruct people how to eating strategies in disasters, such as restricted water, energy and food supplies increased. At food service practicums in the faculty of Nutrition, it procedures making recipes and cook survival food which can be made at home were introduced.

**Methods:** Students made recipes and cooked under the followings conditions as follows; using portable gas heaters, canned food, dried noodles, cooked and dry packed rice, ship biscuits, and dried vegetables. Cooking time should be within 40 minutes, because of portable gas heater limitations. They were not supposed to follow the emergency cooking recipes from books, so lectures taught them to make their original ideas. **Results:** From 2012 to 2015, students have made 40 recipes. For staple foods, dried noodles, cooked and dry packed

rice and chilled rice were often used. Dried noodle was created to other dish, such as pizza and noodles and rice. Cooked and dry packed rice was used in risotto, by putting dried vegetable and a cube of powdered cooking stock to prevent the shortage of fresh vegetable. In main dish, canned mackerel and grilled chicken with carrots and onions, or potatoes were added to a stew which was rich in protein and vitamin C. **Conclusions, discussion and/or practical application:** After making recipes and cooking them, students could find how to use dry foods which they did not use at home or dormitory. Such experience may lead students to be able to instruct those who have to eat and survive during disasters.

**COMPETING INTERESTS:** The authors of this document can confirm there is no conflict of interests.

8 September 2016

## PHYSICAL ACTIVITY AND SPORT

### O-064: INTENDED OR UNINTENDED DOPING? A REVIEW OF THE PRESENCE OF CONTAMINANTS IN DIETARY SUPPLEMENTS USED IN SPORTS AREA

Christian Mañas Ortiz<sup>1\*</sup>, Isabel Sospedra<sup>2</sup>, Ángel Gil-Izquierdo<sup>3</sup>, José Miguel Martínez-Sanz<sup>2</sup>

<sup>1</sup> Clinical Nodrit of Food Education, Valencia, Spain. <sup>2</sup> Nursing Department, Faculty of Health Sciences, University of Alicante, Spain. Research Group on Food and Nutrition (ALINUT), University of Alicante, Spain.

<sup>3</sup> Research Group on Food and Nutrition (ALINUT), University of Alicante, Spain. Department of Science and Food Technology, CEBAS-CSIC, Campus Espinardo-25, Murcia, Spain.

\*Contact: christianmanas@hotmail.es

**Introduction:** The use of supplements is increasingly between athletes year before year. In relation with this high rates of use appear the unintentional doping. The unintentional doping is characterized by a failed doping test due to the use of any supplement contaminated with any substance banned by organizations as World Anti-Doping Agency (WADA). **Methods:** Review about positive cases of substances/metabolites/markers banned by WADA in ergonutritional supplements using PubMed. Inclusion criteria: studies until June 2015, which analyzed the content of substances/metabolites/markers banned by WADA. **Results:** 24 studies were identified, 5 of them fulfilled all the criteria inclusion. 9 studies included were extracted from the references of the articles by manual tracking. The purposes of the major part of the studies were analyze the presence

of anabolic prohormones and stimulants, as well as verified the veracity of the labelling. **Conclusions, discussion and/or practical application:** Some prohibited substances by WADA were found in 20.9% of all supplements analyzed in this review. Some of them were prohormones and stimulants. With rates of contamination between 12-58%, non-intentional doping is a point to take in count before establish any supplementation. Athletes and coaches must be aware of the problems related to the use of any contaminated supplement and take special attention before choose a supplement, being informed and making sure of the security offered by the supplement.

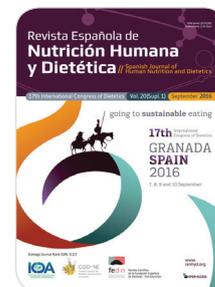
**COMPETING INTERESTS:** The authors of this communication declare that they have no conflict of interest.



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## ORAL COMMUNICATIONS



9 September 2016

NUTRITION EDUCATION

### O-052: FAMILY MEALTIME: HOMESTYLES INSTRUCTIONAL GUIDE AND MINI-PHONE COUNSELING SESSION PROMOTE BEHAVIOR CHANGE

Carol Byrd-Bredbenner<sup>1,\*</sup>, Jessica McKinley<sup>1</sup>, Jennifer Martin-Biggers<sup>1</sup>, Erin Gager<sup>2</sup>

<sup>1</sup>Rutgers University. <sup>2</sup>Penn Medicine/Sodexo.

\*Contact: bredbenner@aesop.rutgers.edu

**Introduction:** Pediatric weight-management nutrition guidelines were used to create the 4-page mini-magazine HomeStyles instructional guides. These guides assist parents of preschool children in modifying their home environment to prevent childhood obesity. **Methods:** Parents (n=31) began with a pre-survey, over 8 weeks they reviewed 1 new guide each week and had a mini-phone counseling session with a dietitian, and took a post-survey. **Results:** Most participants were white (81%), female (94%), and had graduated from college (94%). On the pre-survey, parents reported eating 13.1±5.19SD family meals weekly (means=3.8±2.8SD breakfasts, 3.1±2.3SD lunches, and 6.19±1.22SD dinners). They agreed that family meals were important to them (mean=4.6±0.49SD, on a 5-point scale). The mini-counseling sessions focusing on the Family Mealtimes guide were content analyzed. This guide provides families with strategies for having more family meals more often. During the counseling session, many parents reported they did not always eat meals with their children and listed picky eating, chaotic mealtimes, scheduling differences, and a lack of spousal support as barriers to family mealtimes.

When asked for reasons why family mealtimes are important, parents frequently cited better family communication, more family bonding time, reduced screen-time, less child misbehavior, and development of healthy habits. After reading the guide, many parents reported they intended to eat more meals together as a family, improve time management, and include children in meal preparation. Some set goals to remove clutter from their kitchen table so they could eat meals at the table and to tell their family about the importance they placed on family mealtime. Parents were very confident in their ability to meet these goals, mean=8.53±1.55SD on 10-point scale. At later counseling sessions, most parents reported that had met their goals. **Conclusions, discussion and/or practical application:** The Family Mealtimes guide, along with a mini-phone counseling session, has the potential to successfully aid parents in having family mealtimes more often.

**COMPETING INTERESTS:** The authors of this document can confirm there is no conflict of interests.

## O-055: CAN WE KEEP JAPANESE STYLE WASHOKU? INTAKE RICE MODERATELY PROGRAM

Akiyo Shiohara<sup>1,\*</sup>, Chie Komata<sup>1</sup>, Kaori Fukuta<sup>1</sup>, Tomomi Hirai<sup>1</sup>

<sup>1</sup>Kokusai Gakuin Saitama College, Japan.

\*Contact: ak\_shiohara@yahoo.co.jp

**Introduction:** "Washoku", traditional Japanese cuisine, is now likely to be designated by UNESCO as an Intangible Cultural Heritage. Rice is not only the staple of Washoku, but also had its extensive very old material culture. Today personal rice consumption has become half in this 50yrs. The other hand, the ratio of leanness is still high in young women, while obesity of women aged 40 to 60's having decreased in Japan. Especially, the lean ratio has increased in young women and its most serious problem is the influence on the fetus. **Object:** The intensive care to young adults may be introduced for moderately intake of boiled rice. **Methods:** The participants were 139 Japanese College Students (ages 18-19). At the baseline, self-administrated food frequency questionnaire with 82 food lists (FFQW82) were surveyed. An exercise was given to participants on the concept and usage of the "3•1•2 Meal Box Magic" method. It include: A) Choose an appropriate size box for each, B)fill the box with ideal ratio, 3: Shushoku (staple foods

with grains), 1: Shusai (main dish with fish, meat, and egg), 2: Fukusai (side dish with vegetables). Each had take by the method as they like at least 3 months after the baseline. **Results:** The energy intake (1399.3kcal to 1415.0kcal) and grains intake (656.8kcal to 668.4kcal) had not increased significantly. BMI had increased 3% (20.2kg/m<sup>2</sup> to 20.7kg/m<sup>2</sup>). The double check is now under construction. **Discussion:** The "3•1•2 Meal Box Magic" method showed how much they should be eating. But it was hard to change our eating habit soon. Frequent monitoring and advices had needed to keep motivation. **Conclusions:** The individual mission impression and education of the attitude to the dietary improvement is necessary.

**COMPETING INTERESTS:** A part of this study was funded by Japan rice stable supply assurance organization. The sponsor had no control over the interpretation, writing, or publication of this work.

## O-056: CRITICAL REASONING FOR DIETICIANS; INNOVATING THE PROFESSION

Halime Ozturk<sup>1,\*</sup>, Eva Leistra<sup>1</sup>, Floor Neelemaat<sup>1</sup>, Jacqueline Commandeur<sup>1</sup>, Mariëlle Engberink<sup>1</sup>, Peter Weijts<sup>1</sup>

<sup>1</sup>Department of Nutrition and Dietetics, School of Sports and Nutrition, Amsterdam University of Applied Sciences, Amsterdam, The Netherlands.

\*Contact: h.ozturk@hva.nl

**Introduction:** For optimal diagnostics and dietetic treatment, a systematic approach is warranted. Dietetic treatment focuses on nutritional assessment, nutrition diagnosis, nutrition dietetic intervention and monitoring and evaluation (Nutrition Care Process and Model, ADA 2003). An important skill in this process is critical reasoning. We aimed to develop a systematic framework on critical reasoning for dieticians, both for students and professionals. **Methods:** Critical reasoning includes the ability to integrate and apply different types of knowledge, to weigh evidence, critically think about arguments and to reflect upon the process used to conclude with a dietetic diagnosis. A theoretical framework was developed in collaboration with a team of expert dieticians from all health care settings as part of the DIEET study (DIETetics: Effective and Towards a sustainable profession) following the hypothetico-deductive method, with special focus on the systematic process of formulating and testing (1) initial hypotheses, (2) adjusted hypotheses,

and (3) final hypotheses to determine the optimal treatment plan. **Results:** Based on the systematic framework, a book and (post)graduate teaching courses have been developed. The book consists of 3 parts: (1) theoretical background, (2) step-by-step framework, (3) multiple case studies conform the framework. Out of n=133 dietetic graduate students from the Amsterdam University of Applied Sciences, 85% evaluated the book and framework as a valuable tool for implementing case studies in practice. **Conclusions, discussion and/or practical application:** The systematic approach of critical reasoning results in transparency and optimizing the treatment plan, and therefore should be a major focus in dietetic and post-graduate education. The developed framework and book, including practical examples, can be readily implemented in (post) graduate education for innovation of the profession.

**COMPETING INTERESTS:** The authors of this document can confirm there is no conflict of interests.

## O-058: POSITIVE OUTCOMES OF A STRUCTURED NUTRITION EDUCATION PROGRAM IN PRESCHOOLS

Claudia Sealey-Potts<sup>1,\*</sup>

<sup>1</sup>Professor and Dietetic Internship Director, University of North Florida, Jacksonville, Florida, United States of America.

\*Contact: c.sealey-potts@unf.edu

**Introduction:** Developing appropriate nutritional attitudes and behaviors early in life builds a foundation for later healthy practices in adulthood and teachers can be integral in constructing a healthy environment for young children. The purpose of this study was to evaluate the impact of a nutrition *curriculum* on changes in nutrition and physical activities in preschools. **Methods:** A Registered Dietitian conducted a pre-assessment, followed by a six-hour intensive training of a nutrition *curriculum* among teachers and administrators of preschools. Post-assessment data were collected after one academic year. A 30-item questionnaire measured ease and effectiveness of the nutrition *curriculum*, beverages, fruits and vegetables, meats and fats, feeding environment, active play, screen times and other pertinent demographic characteristics. SPSS version 22.0 was used in data analysis.

**Results:** Sixty-two preschool teachers with outreach to 810 preschool-aged children completed the training. Changes were observed from pre- to post- assessment for beverages, fruits and vegetable offerings: most participants ( $\geq 80\%$ ) provided drinking water inside where it is visible and

freely available; 71% offered 100% fruit juice of "no more than 4-6oz each occasion and encouraged parents to support the limit"; at post-assessment, none (0%) of the participants offered unlimited portions of juice. Sugary drinks were "rarely or never" offered, and reduced fat (1-2%) milk was most frequently offered to children over 2 years at post assessment. Fruit (not juice) and/or vegetable (not French fries, tater tots or hash browns or dried beans) were reportedly offered "most or all of the time" by 71% and 75% of participants. Statistically significant ( $p < 0.05$ ) overall changes were observed for several outcomes including meats and fats, feeding environment, active play time and screen time. **Conclusions, discussion and/or practical application:** Exposure to healthy habits can start with teachers as the conduit for change. Significant lifestyle changes were observed after a casual implementation of a nutrition *curriculum*.

**COMPETING INTERESTS:** The author of this document confirms that there is no conflict of interest.

## O-060: A NUTRITION EDUCATION PROGRAMME FOR SAUDI ADOLESCENTS INVOLVING INTERACTIVE COOKING ACTIVITIES WITH THEIR MOTHERS LEADS TO A CHANGE IN FOOD PURCHASED AND FOOD INTAKE

Eman Alamri<sup>1</sup>, Anne de Looy<sup>1</sup>, Avril Collinson<sup>1,\*</sup>

<sup>1</sup>University of Plymouth.

\*Contact: avril.collinson@plymouth.ac.uk

**Introduction:** This study aims to examine whether interactive cooking activities between mothers and daughters at home, in addition to school based nutrition education sessions for the daughters, leads to a change in household food purchase and the food intake of adolescent girls and their mothers. **Methods:** 207 adolescent girls and their mothers were recruited from 3 matched high schools in Saudi Arabia; 72, 69 and 66 from schools A, B and C, respectively. Using a 4 week cluster randomised design, adolescents in school A received nutrition education and interactive activities (cooking and recipe modifications) to complete at home with their mothers. Adolescents in school B received nutrition education only and school C acted as control. Till receipts for food purchased were collected 4 weeks pre- and 4 weeks post intervention. A food frequency questionnaire was administered pre- and post the intervention. **Results:** In total 163 adolescents and mothers completed the study; 63, 54 and 46 from schools A, B and C, respectively. Post intervention a

significant increase was found in fruit and vegetables purchased for the households in school A ( $p < 0.05$ ). The mean  $\pm$ SD increase was  $197 \pm 34$  and  $121 \pm 29$ g/day per household for fruit and vegetables, respectively. No significant change was observed in food purchased by households in schools B and C. Consumption of fruit and vegetables increased significantly post intervention in school A ( $p < 0.05$ ). The mean  $\pm$ SD increase for adolescents was  $150 \pm 22$  and  $90 \pm 23$ g/day, and among mothers  $169 \pm 25$  and  $78 \pm 19$ g/day for fruit and vegetables, respectively. No significant change was observed in the food intake of mothers and adolescents in schools B and C. **Conclusions:** Nutrition education in the school along with interactive cooking activities between mothers and daughters at home resulted in changes in both household food purchases and the food intake of both adolescents and their mothers.

**COMPETING INTERESTS:** The authors of this document can confirm there is no conflict of interests.

## O-061: FOOD SKILLS AMONG PORTUGUESE ADOLESCENTS: ASSOCIATIONS WITH FOOD FREQUENCY AND PSYCHOLOGICAL VARIABLES

Vânia Costa<sup>1,\*</sup>, Célia Nisa<sup>2</sup>, Rute Borrego<sup>2</sup>, Elisabete Carolino<sup>3</sup>, Lino Mendes<sup>2</sup>

<sup>1</sup> Association of Portuguese Dietitians. <sup>2</sup> Dietetic and Nutrition, Lisbon School of Health Technology, Lisbon, Portugal.

<sup>3</sup> Maths and Statistics, Lisbon School of Health Technology, Lisbon, Portugal.

\*Contact: [vania.costa.diet@gmail.com](mailto:vania.costa.diet@gmail.com)

**Introduction:** At an individual and household level, food skills are a complex, inter-related, person-centred, set of skills that are necessary to provide and prepare safe, nutritious and culturally acceptable meals for all members of one's household. Changes within public school curricula in several countries, has stimulated further concern related to the development of food skills among children and youth. The adolescence are considered to be formative periods during which healthy dietary behaviours may be adopted and sustained and consequently affect long-term health. **Methods:** A food skill scale was developed to measure food skills in a Portuguese adolescent population, and the relationship between food skills and the consumption frequency of three food groups. Additionally, it was determined the relationship between food skills and sociodemographic and psychological variables. **Results:** Data from 124 adolescents (45.2% males) were available for analysis. The Cronbach's alpha was calculated for all the questionnaire's domains ( $0.60 < \alpha < 0.88$ ). Participants' food skills were classified

as "insufficient" (=18.2). Female adolescents food skills were higher (=19.9, SD=8.3) than male adolescents food skills (=16.0, SD=7.9). Food skills correlated positively with fruits and vegetables weekly intake ( $r = 0.22$ ,  $p < 0.05$ ) and negatively with the weekly consumption of convenience food ( $r = -0.19$ ,  $p < 0.05$ ), sweets, snacks and sugar-sweetened beverages ( $r = -0.24$ ,  $p < 0.01$ ). Food skills also revealed a positive correlation with willingness to invest time, mental and physical effort in cooking activities ( $r = 0.26$ ,  $p < 0.01$ ) and cooking enjoyment ( $r = 0.32$ ,  $p < 0.01$ ). **Conclusions, discussion and/or practical application:** In summary, adolescents' food skills may influence their dietary intake and empower them to make healthier food choices. As a result, food skills should be transmitted to children and adolescents and should be taught in schools.

**COMPETING INTERESTS:** The authors of this document can confirm there is no conflict of interests.

## O-062: NUTRITION EDUCATION FOR NURSES AND THERAPISTS FROM THE HOME-VISITING NURSE SYSTEM, AND HOME HELPERS FROM THE HOME-VISITING HELPER SYSTEM

Yoko Takeuchi<sup>1,\*</sup>

<sup>1</sup> Setagaya Social Welfare Corporation.

\*Contact: [y\\_takeuchi@setagayaj.or.jp](mailto:y_takeuchi@setagayaj.or.jp)

**Introduction:** Japan is experiencing a significant increase in the number of elderly people. Although home care systems are spreading, nutritional problems are still very common. Setagaya social welfare corporation has both home-visiting nurse stations and home helper stations, and it placed a dietitian as a consultant for nutritional problems in a pioneering trial in Japan. This study aims to examine the effect of dietitians in home care team. **Methods:** The nurses, therapists, and home helpers provide home care service to patients who have a lot of nutritional problems. The consultations and workshops for them from dietitian was initiated in 2011 and was counted to verify the need for consulting by the dietitian. This analyses included patients were selected by nurses, therapists, and helpers, whether they were instructed about nutritional care from doctor or not, between 2011 and 2014. Also the return of questionnaires about the workshops were analyzed. **Results:** Consultations have steadily increased in frequency, the overall number of consultations in relation to individual patients has

increased; for nurses or therapists: 60 to 85, for helpers: 20 to 47. According to feedback from practical workshops, 96% of those asked (approx. 45 per workshop) stated that workshops were beneficial. This clearly shows that the participating healthcare workers value and require advice from a dietitian. **Conclusions, discussion and/or practical application:** The evidence to date shows that home-visiting service nurses, therapists, and helpers require a dietitian's advice. The nutritional awareness of nurses and therapists has improved. Also helpers have gained vital knowledge on the importance of nutrition for their patients when preparing meals. It is the conclusion of this study that a dietitian can significantly improve the quality of the diet and therefore overall wellbeing for patients and should be considered a necessary member of the home care team.

**COMPETING INTERESTS:** The author of this document confirms that there is no conflict of interest.

## O-059: THE MEALTIME MANAGEMENT EDUCATION AND TRAINING VIDEO IS PERCEIVED TO BE USEFUL AND BENEFICIAL BY STAFF WORKING IN LONG TERM CARE

Roseann Nasser<sup>1,\*</sup>, Sabrina Bovee<sup>1</sup>, Allison Cammer<sup>2</sup>

<sup>1</sup>Nutrition and Food Services, Regina Qu'Appelle Health Region, Regina, Canada.

<sup>2</sup>College of Pharmacy and Nutrition, University of Saskatchewan, Saskatoon, Canada.

\*Contact: [Roseann.Nasser@rqhealth.ca](mailto:Roseann.Nasser@rqhealth.ca)

**Introduction:** Due to the lack of education tools for mealtime management for long term care (LTC) homes, the Regina Qu'Appelle Health Region with its affiliate, the Regina Lutheran Home, created an educational video to enhance the training and education of new and experienced staff (care aides, nursing staff, food service workers, etc.). The purpose of the study was to determine if staff perceived the video to be a beneficial and useful training tool. **Methods:** An email invitation was sent to the Dietitians of Canada Gerontology Network inviting dietitians to participate. A validated 27-item questionnaire was used with permission to assess learning, satisfaction and clinical experience related to the video. Dietitians were asked to show the video to LTC staff and complete the questionnaire. **Results:** A total of 766 surveys were completed by staff at 28 LTC homes across Canada. The majority of participants

worked in their positions for greater than 5 years and were primarily care aides (30%, n=223/743) and food service workers (15%, n=111/740). Sixty-eight percent (n=520/737) of participants felt more knowledgeable after viewing the video and 77% (n=590/739) found the video format made learning about mealtime management easy. Viewing the video caused 89% (n=655/734) of participants to reflect on their resident assessment skills and mealtime management. **Conclusions, discussion and/or practical application:** The results suggest that staff perceive the video to be beneficial to their work with residents living in LTC homes. Dietitians should consider incorporating this tool as part of their practice and training with staff.

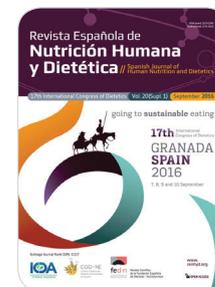
**COMPETING INTERESTS:** The authors of this document can confirm there is no conflict of interests.



# 17th International Congress of Dietetics

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## ORAL COMMUNICATIONS



9 September 2016

### TEACHING, EDUCATION AND TRAINING OF THE DIETITIAN-NUTRITIONIST

#### O-072: THE DEVELOPMENT OF THE DIET-COMMS TRAINING PACKAGE; SUPPORTING EFFECTIVE COMMUNICATION SKILLS WITHIN DIETETIC CONSULTATIONS

Kirsten Whitehead<sup>1,\*</sup>

<sup>1</sup>University of Nottingham, UK.

\*Contact: [kirsten.whitehead@nottingham.ac.uk](mailto:kirsten.whitehead@nottingham.ac.uk)

**Introduction:** Communication skills that facilitate behaviour change are key skills for dietitians. Most patient contact is face-to-face and the quality of communication impacts on patients' ability to change dietary behaviour. The standard of communication skills a dietitian has varies depending the training they received both before and after qualifying. The aim of this project was to develop a web based open access training package to support the development and assessment of communication skills in dietetics. **Methods:** Funding was successfully obtained from the British Dietetic Association General and Education Trust (BDA GET) to support the development of the training package based on the previously validated assessment tool, DIET-COMMS. An advisory group including a practising dietitian, student dietitians, a service user and academic staff directed the project. Videos of simulated consultations were created using the scenario of an individual newly diagnosed with type II diabetes. **Results:** An open access web-based training package is available to support student and qualified dietitians with the development and assessment of communication skills. The package consists of videos, freely

downloadable resources including the DIET-COMMS tool, feedback sheets to help direct skill development and service user views. Guidance sheets include how to give constructive feedback, integrating peer-observation in the workplace, student assessment and self-assessment. Training package users can practice assessing the videos and access the expert view. An evaluation programme is under development to assess use and effectiveness of the training package within dietetic training and clinical practice. **Conclusions, discussion and/or practical application:** The DIET-COMMS training package is now available. It has potential to support the development of communication skills in dietetic training and clinical practice but needs evaluation to ascertain its effectiveness. Having such a widely available training package increases the potential to undertake research into the development and assessment of communication skills in dietetics.

**COMPETING INTERESTS:** The authors confirm there is no conflict of interest.

## O-073: A PILOT STUDY TO EVALUATE DIETETIC STUDENT PLACEMENT CASE MIX EXPOSURE

Mealey Elaine<sup>1\*</sup>, Kainth Preetpal<sup>1</sup>

<sup>1</sup>London Metropolitan University.

\*Contact: e.mealey@londonmet.ac.uk

**Introduction:** Placement programme learning outcomes are designed to produce a flexible and responsive dietetic workforce with transferable skills and competencies fit for to serve the NHS environment. The health needs of the UK are changing with an ageing population in which an increasing number of people have multiple long-term conditions who require dietetic care delivered in their community or at home. In addition technology is revolutionising how dietitians communicate and patients' access dietetic information and services. Due to these changes, the placement setting and case-mix (types and variety of patients) students are exposed to have evolved. To date, there are no studies of dietetic student placement case-mix exposure available in the UK literature database. **Aim:** To determine the attributes of clinical dietetic student placement exposure. **Methods:** Postgraduate students (n=12) at London Metropolitan University completed a data collection form for one day in August 2015 during week 8 of Placement 2. Descriptive statistics were used to describe the distribution of patient exposure by site with authors determining case categorisation.

Ethics approval was obtained from LMU University Human Research Ethics Committee. **Results:** Six students (66%) met the inclusion criteria. Participants completed their placements at three different clinical sites in London. Daily caseloads ranged from two to nine patients per student. All students were exposed to adult caseloads only. The majority (71%) of the patients were follow-up contacts seen at outpatient clinics (78%). Students were exposed to nine different disease categories' in their patient caseload. **Conclusions:** This is the first known UK investigation of placement student case mix exposure. Despite limitations, this small study highlights the marked variability in student exposure to different disease categories and caseload numbers across a small number of placement sites. There is a need for comprehensive data collection across the entire placement profile to establish minimum case-mix exposure required to demonstrate competency during clinical placement.

**COMPETING INTERESTS:** The authors state that there is no conflict of interest.

## O-074: ARE NUTRITION AND DIETETIC STUDENTS PREPARED TO BE EFFECTIVE INTERPROFESSIONAL TEAM LEADERS?

Carrier Natalie<sup>1\*</sup>, Talbot France<sup>1</sup>, Jbilou Jalila<sup>2</sup>, Dubé Anik<sup>1</sup>, Beauchamp Jacinthe<sup>3</sup>, Landry Véronique<sup>1</sup>, Guérette Marie-Josée<sup>1</sup>

<sup>1</sup>Université de Moncton. <sup>2</sup>Université de Moncton; Centre de formation médicale du Nouveau-Brunswick.

<sup>3</sup>Centre de formation médicale du Nouveau-Brunswick.

\*Contact: natalie.carrier@umoncton.ca

**Introduction:** Health education programs have made advances in integrating interprofessional (IP) activities in their *curriculum*. However, little is known about what predisposes students to integrate IP collaboration in their future practices. Study objectives aimed to determine association between learning skills, personality traits, and attitude towards IP among nutrition and dietetics university students (DTs); and to compare DTs characteristics with those of students from other health programs (OHP). **Methods:** University students enrolled in health programs were recruited (N=326). Of these, 57 were DTs. Participants completed a survey that included: "Interest in IP learning" subscale from the Readiness for Interprofessional Learning Scale (RIPLS-I) that measures attitude towards IP learning; Learning and Study Strategies Inventory Scale (LASSI), which measures skill, will, and self-regulation; and

NEO Five-Factor Inventory-3 (NEO-FFI-3) that measures five personality traits. **Results:** Preliminary results show that the overall sample of students presents positive attitudes towards IP learning (RIPLS-I). T-tests revealed no significant difference between DTs and OHP students on the RIPLS-I (t=-1.72, p=.09), nor on the LASSI's subscales (all ps=NS). However, "skill", which includes information processing, selecting of main ideas and test strategies, was the most correlated learning strategy with the RIPLS-I (r=.29, p<.001). All NEO-FFI-3 scores were in the average range with the exception of "extraversion", which was in the high range in both groups of students. "Extraversion" was the NEO-FFI-3 personality trait that was the most correlated with the RIPLS-I (r=.266, p<.001). **Conclusions, discussion and/or practical application:** DTs show high levels of interest in collaborative practice. University programs

wishing to improve students learning experiences that aim to promote dietitians as effective IP team leaders would benefit from integrating innovative educational strategies tailored to students' personality traits. Further analyses will be performed

to examine differences across the continuum of learning and propose practical recommendations.

**COMPETING INTERESTS:** The authors of this document can confirm there is no conflict of interests.

## O-075: EIGHT YEARS AND COUNTING: OBSERVATIONS ON THE DIETETIC OSCE EXAM AND PLACEMENT OUTCOME

Tracey Parkin<sup>1\*</sup>, Avril Collinson<sup>1</sup>

<sup>1</sup>Plymouth University.

\*Contact: [tracey.parkin@plymouth.ac.uk](mailto:tracey.parkin@plymouth.ac.uk)

**Introduction:** Objective Structured Clinical Examinations (OSCE's) have been used extensively in medical, nursing and allied health training. The use of OSCE's in dietetic training is still relatively new, this paper explores 8 years of OSCE data and relationships to placement outcome. **Methods:** Data was collected retrospectively on 277 students who had completed the final year OSCE and final year placement between 2007-2015. OSCE's contain two active and at least two passive stations to assess discrete dietetic skills used in practice when working through the Nutrition and Dietetic Care Process (NDCP). The aggregate OSCE mark and the mean mark obtained in both the active and passive stations were compared to placement outcome. **Results:** The strongest predictor of placement outcome was the mean mark achieved in the two active stations: mean of 65% (SD 11.22) was associated with students passing placements (n=237) and mean of 56% (SD 13.34) was associated with difficulties (requiring extra supervisory

support and or time on placement), this difference was significant p=0.000. Difficulties highlighted included problems with interpretation of data, application of knowledge and communication skills needed to implement the NDCP. Of those who experienced difficulties on placement 50% (20/40) continued to experience difficulties with applying the NDCP and therefore did not meet the placement learning outcomes resulting in a failed placement. **Conclusions, discussion and/or practical application:** Variation in performance with two active OSCE stations is common in dietetic students. Mean active station mark is a good indicator of student outcome on placement. The OSCE is therefore a useful tool to help with planning, indicating which students may require additional support prior to and during placement.

**COMPETING INTERESTS:** The authors of this document can confirm there is no conflict of interests.

## O-076: VIDEO RECIPES PROVIDE AN IDEAL WAY OF BOTH PROMOTING HEALTHY EATING AND FOR RECOVERING OUR CULINARY TRADITIONS

Eva María Trescastro López<sup>1\*</sup>, Josep Bernabeu-Mestre<sup>1</sup>, Josep Xavier Esplugues Pellicer<sup>1</sup>, M<sup>a</sup> Eugenia Galiana Sánchez<sup>1</sup>, María Tormo Santamaría<sup>1</sup>

<sup>1</sup>Balmis Research Group on Community Health and History of Science. University of Alicante.

\*Contact: [eva.trescastro@ua.es](mailto:eva.trescastro@ua.es)

**Introduction:** The Nutritional Education subject in the 4<sup>th</sup> year of the degree course in Human Nutrition and Dietetics at the University of Alicante addresses issues relating to food and culinary traditions and deals with cultural, health and nutrition, economic, environmental and agricultural aspects presented through a video recipe. The objectives of this innovative methodology for the university environment are to stimulate students' interest in culinary traditions, creating awareness of their culinary heritage, and to encourage the recovery of traditional dishes. **Methods:** This new venture was launched with the participation of students on the Nutritional Education

course (123 students). They had to rediscover a traditional recipe and record its preparation on video. The video-recipe had to include: ingredients per person, the cooking method, and context was also provided, namely, showing how, when and where this dish was eaten, what to drink with it and how and the recipe was first invented. Subsequently students explained their video recipe, the nutritional value of each dish was discussed in a group situation and students reflected on how the dish it could be incorporated in their present diet. **Results:** During the 2013-2014 and 2014-2015 academic courses, 24 video recipes were created. The "Pumpkin stew" recipe can

be consulted by way of example: <https://www.youtube.com/watch?v=od06YTjpZdc>. **Conclusions:** This methodology can be used to work with concepts relating to food and nutrition education in order to promote healthy eating and to recover culinary traditions. Most of the recipes, many of which are foods for festive occasions and celebrations, need to be readapted to current nutritional needs, reducing their calorific content and

the proportions of some of their ingredients. Another positive aspect is how the idea of recycling has been recovered, making full use and/or reuse of all the foods used, as well as taking advantage of seasonal produce.

**COMPETING INTERESTS:** The authors of this document can confirm there is no conflict of interests.

## O-077: APPLICATION OF JAPANESE EXPERIENCE FOR ESTABLISHMENT OF "NUTRITION BACHELOR COURSE" AND DIETITIAN SYSTEM IN VIETNAM

Miki Miyoshi<sup>1\*</sup>, Shigeru Yamamoto<sup>2</sup>, Teiji Nakamura<sup>3</sup>

<sup>1</sup>National Institute of Health and Nutrition, National Institutes of Biomedical Innovation, Health and Nutrition, Japan; Committee for International Collaboration, The Japan Dietetic Association. <sup>2</sup>Jumonji University, Japan; Committee for International Collaboration, The Japan Dietetic Association. <sup>3</sup>Kanagawa University of Human Services, Japan.

\*Contact: [mikimiy@nih.go.jp](mailto:mikimiy@nih.go.jp)

**Introduction:** Disease burden of not only undernutrition and infectious diseases but also non-communicable diseases (NCDs) like diabetes and cardiovascular diseases have been increasing in Vietnam too. Whilst there is a growing awareness on importance to work on the global issue of "double burden of malnutrition", the country had neither any professional training courses nor the licensing system for dietitian. Under this circumstance, Ajinomoto Co. Inc. launched "Vietnam Nutritional System Establishment Project in 2009". As a part of this project, the first Nutrition Bachelor Course was established at the Hanoi Medical University (HMU) in October 2013, in collaboration with the Jumonji University. In order to enhance the capacity of this bachelor course by providing technical support, agreement of academic collaboration was concluded between three Japanese institutions (Jumonji University, Kanagawa University of Human Services, Japan Dietetic Association) and two Vietnamese ones (HMU and National Institute of Nutrition) in March 2014. **Methods:** This presentation aims to report the academic supports provided to the HMU since

2014, and discuss the progress and future recommendation. **Results:** In total, 21 Japanese university professors/lectures were dispatched as visiting professors, to support the lectures on Basic Nutrition, Clinical Nutrition and Community Nutrition etc. in 2014-2015. Besides, various materials and equipment (e.g., for anthropometric measurements, for laboratorial experiments) were provided to support the practical sessions. Establishment of dietitian licensing system has been in progress by the government, by which the first dietitians will be produced in 2017. **Conclusion:** As the first dietitian training course in Vietnam, it is expected to secure sustainability of "Nutrition Bachelor Course" at the HMU, for which, Japanese long-term experience of dietitian training programs has been well incorporated. Further efforts are required to organize the practical sessions more comprehensively, by which the students could acquire the necessary skills in their future job positions as dietitians.

**COMPETING INTERESTS:** The authors of this document confirm that there is no conflict of interests.

## O-078: AUGMENTING EDUCATION AND TRAINING OF NUTRITION PROFESSIONALS USING TECHNOLOGY: STUDIES IN JAPAN & ISRAEL

Rebecca Brody<sup>1\*</sup>, Diane Rigassio Radler<sup>1</sup>, Riva Touger-Decker<sup>1</sup>

<sup>1</sup>Rutgers University, School of Health Related Professions, Department of Nutritional Sciences.

\*Contact: [brodyra@shrp.rutgers.edu](mailto:brodyra@shrp.rutgers.edu)

**Introduction:** Distance learning platforms and virtual environments offer opportunities to educate and train students and professionals globally. The School of Health Related Professions Graduate Programs in Clinical Nutrition have collaborated with academic institutions and health ministries

in Japan and Israel using technology for education and training. **Objectives and target population:** Changes in knowledge, practice patterns and skills have been analyzed using mixed methods approaches with faculty, preceptor and student groups. **Principal theories and interventions:** Using the SAMR

(Substitution, Augmentation, Modification and Redefinition) model, technology was first substituted for parts of classroom education using distance learning platforms (WEBCT and MOODLE) in Japan and subsequently used to augment and modify training in evidence analysis and nutrition-focused physical examination with the same group. The model tested in Japan was subsequently used in grant-funded efforts for instruction and training on nutrition focused physical examination with dietitian and dietetic student groups from the Israel Ministry of Health and U.S. and Israel universities. A train-the-trainer model for preceptors and dietetic educators was trialed. **Evaluation and Results:** Qualitative results revealed positive changes in clinical practice, research skills and student training among participants in Japan. In Israel,

results revealed statistically significant positive changes in knowledge and practice patterns over time. Nutrition focused physical examination skills testing, conducted for the first time in 2015 in the U.S. and Israel, revealed students were able to learn new skills and demonstrate these skills via a distance platform (Adobe Connect). **Conclusions of authors and discussion:** Using the SAMR model, technology-enhanced education, training and skills assessment is feasible and permits 24/7 self-paced access to materials for participants and live interaction between faculty and students regardless of location.

**COMPETING INTERESTS:** The authors of this document confirm that there is no conflict of interests.



9 September 2016

## REGULATION OF THE PROFESSION OF THE DIETITIAN-NUTRITIONIST

### O-033: DEVELOPING A NEW NATIONAL NUTRITION AND DIETETICS DEGREE PROGRAM IN PURSUANCE OF AN OUTCOMES-BASED QUALITY ASSURANCE SYSTEM

Adela Cristeta Jamorabo-Ruiz<sup>1,\*</sup>

<sup>1</sup>Polytechnic University of the Philippines and President, Nutritionist-Dietitians' Association of the Philippines.

\*Contact: [acjrui@gmail.com](mailto:acjrui@gmail.com)

**Introduction:** ASEAN Integration is envisioned to create greater opportunities for the region's economic growth and that of its people especially the regulated professions which include the nutritionist-dietitians. New policies, standards and guidelines (PSG) for the Bachelor of Science in Nutrition and Dietetics (BSND) will be issued by the national government through the Commission on Higher Education (CHED) effective SY 2018-2019 in pursuance of an outcomes-based quality assurance system. **Methods:** This paper documented the development of a new, enhanced BSND program to replace the existing PSG issued in 2006. Using the five phases of development: needs assessment, preliminary planning and decision making, developing goals and objectives, developing content, and writing; faculty members teaching the professional courses

nationwide participated in a series of seminar-workshops to revise the *curriculum* using the guidelines issued by CHED and the Philippine Professional Regulation Commission (PRC). The activities were conducted by the Technical Committee on Nutrition and Dietetics Education (TCNDE) and the Council of Deans and Heads of Nutrition and Dietetics Schools (CODHEND). **Results:** The output PSG contained nine (9) articles comprising of: Introduction, Authority to Operate, General Provisions, Program Specifications, Program Specifications, Required Resources, Compliance of HEIs, Sanctions for Non-Compliance and Transitory, Repealing and Effectivity Provisions. To validate the output, an expert group representing different fields of practice from the Nutritionist-Dietitians' Association of the Philippines (NDAP) had consultation-meetings with the TCNDE.

The output of the consultations was endorsed to CODHEND for agreement and harmonization. The TCNDE finalized the PSG which was submitted to CHED for approval. **Conclusions, discussion and/or practical application:** Documenting the process including the challenges encountered in crafting a BSND program aligned with K-12 and outcomes-based

education may assist other professions to describe experiences, lessons learned, novel ideas/resources for improving or enhancing their curricular programs whose graduates are expected to practice across borders.

**COMPETING INTERESTS:** The author of this document confirms that there is no conflict of interests.

## O-079: A MODEL FOR SELF-REGULATION OF THE PROFESSION: A DIETETIC CREDENTIALING COUNCIL

Robynne Snell<sup>1</sup>, Julie Hulcombe<sup>2\*</sup>, Tania Passingham<sup>3</sup>

<sup>1</sup>Curtin University, Western Australia. <sup>2</sup>Department of Health, Queensland. <sup>3</sup>Dietitians Association of Australia.

\*Contact: [julie.hulcombe@health.qld.gov.au](mailto:julie.hulcombe@health.qld.gov.au)

**Introduction:** Historically, Dietitians have not been registered in any jurisdiction in Australia since the 1980s. In this regulatory environment, the Dietitians Association of Australia (DAA) implemented a self-regulation credentialing model in mid 1990s, the Accredited Practising Dietitian (APD) program overseen by the DAA board. In 2010 the Commonwealth government enforced a nationally consistent legislation for health professionals' regulation. In response, the Board moved to strengthen the self-regulation framework for the profession. Dietetics was not included in first round of registration, and recently confirmed it was not likely to be in the near future.

**Methods:** To model parallel requirements of registered professions and their national governance structure, DAA established two independent councils – the Australian Dietetic Council (ADC) which manages university accreditation; and the Dietetic credentialing Council (DCC) to advise and make recommendations to the Board on matters relating to credentialing, self-regulation, continuing professional development (CPD), and policy. The DCC, the focus of this paper, comprises external members representing Education and Training, Credentialing and Regulation, and health

consumers. The remainder of the council is made up of senior APDs appointed via a competitive selection process. **Results:** Since commencing, DCC has addressed a range of issues: a) Developing - the definition of dietetic practice, a Resumption of Accredited Practice policy, and a Declaration of fitness to practice; b) Reviewing - the Scope of Practice decision tree, the Provisional APD Program including mentoring guidelines, best practice for CPD requirements, and the application process for Advanced APD credential. Future work by DCC includes providing governance for complaints management, reviewing competencies for the advanced credentials and exploring credentialing of extended scope of practice, such as prescribing, in a self-regulated environment. **Conclusions, discussion and/or practical application:** DCC has strengthened the self-regulation framework for the 5400 APDs members with more rigorous, independent structures and processes to ensure safety and quality for the public.

**COMPETING INTERESTS:** Robynne Snell is a member of the Dietetic Credentialing Council. Julie Hulcombe is the Chair of the Dietetic Credentialing Council. Tania Passingham is a staff member of the Dietitians Association of Australia.

## O-080: A PROJECT BY THE BRITISH DIETETIC ASSOCIATION TO PRODUCE AN EVIDENCE BASED RESOURCE TO SUPPORT SAFE STAFFING AND SAFE WORKLOADS IN DIETETIC SERVICES IN THE UK

Kiri Elliott<sup>1\*</sup>, Sue Perry<sup>1</sup>, Katrina Evans<sup>1</sup>, Diana Markham<sup>1</sup>, Timothy Hoe<sup>1</sup>

<sup>1</sup>The British Dietetic Association.

\*Contact: [littlepomki@gmail.com](mailto:littlepomki@gmail.com)

**Introduction:** NHS staffing levels are a focus of attention of both the public and frontline staff and are also currently a hot topic at national policy level. The BDA often receives enquiries regarding staffing and workload safety from members. There

is little published evidence on safe staffing levels in dietetic services. The BDA sought to address this and provide guidance to the profession by carrying out a project in 2015. **Methods:** A working group of 5 dietitians carried out a literature review

before developing and circulating a questionnaire to all BDA members. All dietitians and dietetic support workers employed by the NHS (with no exclusion criteria) were invited to complete it anonymously. Respondents (n=933, 18% NHS dietetic workforce) were asked about their work activities, number of patient contacts per week and to select if they felt their caseload was either 'safe' or 'unsafe'. A separate questionnaire with similar questions was also developed and circulated to managers to gain an understanding of managers' perspective on their workforce (n=14). Optional open-ended questions allowed for qualitative data collection in both questionnaires.

**Results:** Questionnaire analysis showed an average of 72% of dietetic time was spent on patient focused activities, whilst 28% of work time was spent on non-patient related activities. 43%

of the workforce felt their caseload was unsafe. 20 concerns of an unsafe workload were ranked according to frequency of selection. Manager data was congruent with individual dietitians and support workers. **Conclusion/Practical Application:** The BDA has produced a guidance toolkit for members, which using both the quantitative and qualitative data obtained, has been tailored around the key concerns raised by respondents (such as not being able to see patients in a timely manner). The guidance document also provides useful numerical benchmarks, which can be used by clinicians and managers when addressing workload issues.

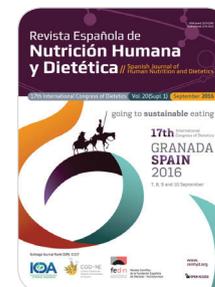
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## ORAL COMMUNICATIONS



9 September 2016

RESEARCH ON BASIC AND APPLIED NUTRITION

### O-065: GLUCAGON-LIKE PEPTIDE-1 AND FOOD REWARD: A DIALOGUE BETWEEN THE GUT AND THE BRAIN

Bodnaruc Alexandra Maria<sup>1,\*</sup>, Blanchet Rosanne<sup>1</sup>, Prud'homme Denis<sup>1</sup>, Giroux Isabelle<sup>1</sup>

<sup>1</sup>Faculty of Health Sciences, University of Ottawa, Ottawa, Ontario, Canada. Montfort Hospital Research Institute, Nutrition and Metabolism Laboratory, Ottawa, Ontario, Canada.

\*Contact: [abodn049@uottawa.ca](mailto:abodn049@uottawa.ca)

**Introduction:** Feeding behaviour is driven by both metabolic needs and hedonic hunger. The latter refers to food reward processing and involves brain reward circuitry. Food reward can be qualified as either anticipatory or consummatory. The concept of "food addiction" is suggested to result from enhanced anticipation to consume foods (anticipatory food reward/AFR), but dampened sensitivity to their rewarding effect (consummatory food reward/CFR). Glucagon-like peptide-1 (GLP-1), a peptide secreted by gut cells and brainstem neurons, is thought to modulate food reward. The aim of this review is to describe GLP-1 effects on food reward in conditions of normal and excess body adiposity. **Methods:** A search in the PubMed database was conducted to identify articles published between January/2005 and October/2015. Combinations of the following terms were used: [GLP-1], [food reward/hedonic eating], [mesolimbic system/reward pathways], [obesity/overweight]. Selection criteria included: experimental studies conducted in animals or humans, any sample sizes or intervention durations. **Results:** Fifty-seven relevant articles were identified, and 24 articles fitting all selection criteria were

retained. Findings can be summarized in three key points: 1) GLP-1 receptors are present in the brain reward circuitry, and their activation reduces AFR in healthy animals and humans; 2) Obesity and prolonged intake of highly rewarding foods is associated with increased AFR and decreased CFR. This difference appears to be partly mediated by GLP-1; 3) Interventions increasing circulating GLP-1 concentrations reduced AFR in obese animals and humans and increased CFR in both normal weight and obese individuals. **Conclusions, discussion and/or practical application:** Alteration of food reward processing appears to be an important component of overeating and associated weight gain. Interventions increasing GLP-1 concentrations may be effective for weight management among normal weight and obese individuals. As the release of several gut peptides is dependent on the type of macronutrients consumed, the development of food matrices promoting GLP-1 secretion may be a relevant nutritional lead.

**COMPETING INTERESTS:** The authors of this document can confirm there is no conflict of interests.

## O-066: HEALTHY EATING USING *PINGGANG PINOY* – A HEALTHY FOOD PLATE FOR FILIPINOS

Ma. Jovina Sandoval<sup>1,\*</sup>, Carl Vincent Cabanilla<sup>2</sup>, Robby Carlo Tan<sup>3</sup>, Mario Capanzana<sup>1</sup>

<sup>1</sup> Food and Nutrition Research Institute - Department of Science and Technology, Manila, Philippines.

<sup>2</sup> Food and Nutrition Research Institute - Department of Science and Technology, Manila, Philippines.

<sup>3</sup> Food and Nutrition Research Institute - Department of Science and Technology, Manila, Philippines.

\*Contact: majovinasandoval@yahoo.com

**Introduction:** The so-called “double-burden of malnutrition” continues to be a major public health problem in the Philippines. According to the 2013 National Nutrition Survey (NNS), 3 out of 10 adults aged eighteen years and over are overweight and obese; while 1 out of 10 adults are chronically energy-deficient. With the current health status that we have, the Food and Nutrition Research Institute (FNRI-DOST), Department of Health (DOH) and WHO Philippines agreed to take initiative to address the non-communicable diseases (NCDs) and malnutrition through the development of a new food guide. The study aimed to develop a plate-based food guide for apparently healthy Filipinos that will serve as a nutrition tool in preparing healthy and well-balanced meals to achieve adequate nutrition. **Methods:** The development process adopted a science-based approach using the best available scientific evidence from local and international sources on food and nutritional requirements, while taking into account the usual dietary pattern of Filipinos, their health

and nutritional status, prevailing socio-economic conditions, cultural variations, issues of food supply and production, and stakeholder feedback. **Results:** The *Pinggang Pinoy* healthy food plate emphasizes three food groups: “Go” (rice and alternatives), “Grow” (fish and alternatives) and “Glow” (vegetables and fruits), reflecting the usual Filipino diet. The guide shows the recommended proportion by food group. Half of the plate is occupied by vegetables and fruits. While the rice and protein group should take up the other half (with more rice than protein source). A glass of water was incorporated to highlight the importance of hydration in the body. **Conclusions, discussion and/or practical application:** A per meal food guide for apparently healthy Filipinos was developed using a familial food plate model to convey in a simple and understandable way the concept of eating a variety of foods in the right proportion to meet the body’s energy and nutrient needs.

**COMPETING INTERESTS:** The authors of this document can confirm there is no conflict of interests.

## O-067: TEENS AS TEACHERS IN THE GARDEN: EFFECTS ON YOUTH VEGETABLE INTAKE AND PREFERENCE

Virginia Bolshakova Dr.<sup>1,\*</sup>, John Gieng Dr.<sup>1</sup>, Lorena Gimeno<sup>2</sup>, Mary Vollinger<sup>3</sup>

<sup>1</sup> University of California Agriculture and Natural Resources. <sup>2</sup> Terapia Activa. <sup>3</sup> University of California CalFresh Nutrition.

\*Contact: vbolshakova@ucanr.edu

**Introduction:** The Healthy Living Ambassador (HLA) Program has brought nutrition and fitness, teen leadership and teamwork to the forefront in California elementary school gardens through community-based partnerships. Teen Ambassadors (HLAs) trained at UC Elkus Ranch (Half Moon Bay, CA) in the basics of food cultivation, nutrition, fitness, community leadership, childhood development, and instructional practices to teach children healthy living skills while growing a vegetable garden. HLAs deliver an 8-week, garden-based, afterschool nutrition and physical education program to elementary school children, during which, teens plant and nurture seeds side-by-side with children while building leadership skills. **Objectives:** 1) Determine the effects of the 8-week HLA Program on youth’s vegetable selection, intake and consumption behavior, and 2) Compare the instructional effectiveness of teen teams as teachers (ages 13-19) vs. adult nutrition content

experts delivering the same program. **Methods:** Written food preference, self-efficacy, and CA 4-H CYFAR youth surveys (pre/post) were administered to teen HLAs (N=31) and adult controls (N=3), and two populations of elementary children, either participating (N±80) or not participating (N±80) in the HLA Program. A vegetable choice and consumption behavior assay (pre/post, adapted from TTT) was completed. Teachers were evaluated by nutrition educator observations and subject interviews. **Results:** Elementary school children reported increased preference for vegetables, gardening, and science after participation in the HLA Program. Teens consumed more vegetables after participation in the HLA program. Qualitative data further revealed increased self-efficacy for teens in the areas of science, community leadership, and nutrition. **Conclusions, discussion and/or practical application:** Results indicate youth (all ages) engaged in cultivation of their own

vegetables can lead to increased preference and consumption for those vegetables. Benefits of teens-as-teachers of nutrition and physical education in the gardens extended beyond basic health and nutrition into policy, environment, and systems

change at the community level. Teen teachers felt empowered to make a difference in their communities.

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## O-069: EXPERIMENTAL MODELS OF LEIGH SYNDROME FRENCH CANADIAN VARIANT: IMPACT OF INFLAMMATORY AND NUTRITIONAL STRESS

Almeida Rafaela<sup>1</sup>, Tremblay Mélanie<sup>2</sup>, Rose Christopher<sup>1</sup>, Bemeur Chantal<sup>1,\*</sup>

<sup>1</sup> Université de Montréal. <sup>2</sup> CRCHUM.

\*Contact: [chantal.bemeur@umontreal.ca](mailto:chantal.bemeur@umontreal.ca)

**Introduction:** Mutation of the LRPPRC gene encoding a leucine-rich pentatricopeptide repeat protein is responsible for the French Canadian variant of Leigh Syndrome (LSFC), a severe metabolic disorder characterized biochemically by a tissue-specific (liver and brain) deficiency of cytochrome c oxidase (COX) and clinically by the occurrence of deadly acidotic crises. Nearly 80% of children afflicted by this disease die before age 4. The mechanisms responsible for these crises remain unclear. In this study, we used fibroblasts from LSFC patients and liver-specific LRPPRC knock-out (KO) mice as working models to test the hypothesis that LRPPRC mutation: 1) predisposes LSFC fibroblasts to impaired mitochondrial function and cell death following inflammatory and nutritional stress and, 2) impacts on cerebral structure in LRPPRC KO mice. **Methods:** Calcium retention capacity (CRC), oxygen (O<sub>2</sub>) consumption and mitochondrial membrane potential (MMP) were assessed in control and LSFC fibroblasts. The effect of omega-3 fatty acids (eicosapentaenoic and docosahexaenoic acids; 50µM) was also evaluated. For studies with KO mice, neuron and cell counts were evaluated by immunohistochemistry using Neuronal Nuclei and 4',

6'-diamidino-2-phenylindole, respectively. **Results:** Compared to controls, LSFC fibroblasts showed multiple abnormalities under inflammatory and nutritional stress (tumor necrosis factor-alpha, 100ng/mL and albumin-conjugated palmitate, 1mM), including decreased CRC, O<sub>2</sub> consumption and MMP as well as increased cell death. Interestingly, omega-3 fatty acids decreased cell death and increased MMP in LSFC fibroblasts submitted to inflammatory and nutritional stress, compared to controls. LRPPRC KO mice display decreased neuronal count in brain stem and altered cellular morphology in cerebellum, compared to wild-type mice. **Conclusions, discussion and/or practical application:** Together, these results suggest that mitochondria from LSFC fibroblasts are dysfunctional and this may limit their capacity to maintain homeostasis, particularly under conditions of inflammatory and nutritional stress. Furthermore, omega-3 fatty acids may prove beneficial in preventing acidotic crises. Finally, LRPPRC KO mice display cerebral abnormalities.

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## O-070: THE FAT BENEFITS OF NUTRIENT MALABSORPTION IN OBESE PATIENTS WITH TYPE 2 DIABETES

Lucia Martinez de la Escalera Clapp<sup>1,\*</sup>, Ioannis Kyrou<sup>2</sup>, Jana Vrbikova<sup>3</sup>, Vojtech Hainer<sup>3</sup>, Petra Sramkova<sup>4</sup>, Martin Fried<sup>4</sup>, Philip G McTernan<sup>1</sup>

<sup>1</sup> Warwick Medical School, University of Warwick, Coventry, UK. <sup>2</sup> Aston Medical School, Aston University, Birmingham, UK.

<sup>3</sup> Institute of Endocrinology, Prague, Czech Republic. <sup>4</sup> OB Clinic, Prague, Czech Republic.

\*Contact: [mdrnc@warwick.ac.uk](mailto:mdrnc@warwick.ac.uk)

**Introduction:** Mitochondria are key to maintaining metabolic health and versatile nutrient sensors. However, during severe obesity mitochondria in human fat are overloaded with excess nutrients, leading to impaired energy efficiency, oxidative stress and reduced lipid buffering capacity. Therefore bariatric surgery options which can either restrict nutrient availability

or induce nutrient malabsorption may offer benefits beyond simple weight loss to improve mitochondrial health in human fat. **Methods:** Forty-three morbidly obese, T2DM women underwent either malabsorptive (bilio-pancreatic diversion [BPD], n=13) or restrictive (gastric banding [GB], n=14; gastric plication [GP], n=16) bariatric operations in an ethics-approved

study. Mitochondrial number and gene markers of function and efficiency were assessed via qRT-PCR in abdominal subcutaneous adipose tissue biopsies taken before and 6 months after surgery. **Results:** Bariatric surgery per se improved metabolic health in all subjects, although more pronounced in malabsorptive surgery where the remission rates of T2DM (69%) and dyslipidaemia (86%) were approximately double those with restrictive operations. Also, malabsorptive surgery led to improved mitochondrial efficiency and function as noted by mitochondrial number being positively correlated with mitochondrial genes assessed. **Conclusions, discussion**

**and/or practical application:** The malabsorptive surgery led to enhanced mitochondrial efficiency, quality and overall function in tandem with greater rates of excess weight loss, T2DM remission and correction of dyslipidaemia than nutrient restriction alone. Thus, limiting nutrient absorption appears to improve overall metabolic health as well as alleviating the stress caused by excess lipids on human abdominal fat tissue.

**COMPETING INTERESTS:** The authors of this document can confirm there is no conflict of interests.

## O-081: PROTEIN INTAKE AND DIETARY PROTEIN QUALITY OF ADULTS: URBAN AND RURAL DISPARITY IN TURKEY

Burcu Aksoy<sup>1,\*</sup>, Derya Dikmen<sup>1</sup>, Pelin Bilgiç<sup>1</sup>, Gülgün Ersoy<sup>1</sup>, Mehmet Fisunoğlu<sup>1</sup>, Mevlüde Kızıl<sup>1</sup>, Karaagaoglu N<sup>1</sup>, Mercanligil SM<sup>1</sup>, Samur G<sup>1</sup>, Özel HG<sup>1</sup>, Pekcan AG<sup>1</sup>, Rakıcıoğlu N<sup>1</sup>, Yıldız EA<sup>1</sup>, Çelik F<sup>1</sup>, Demir S<sup>1</sup>, Ersoy N Yılmaz D<sup>1</sup>, Tamer F<sup>1</sup>, Turkoglu İ<sup>1</sup>, Yalcin T<sup>1</sup>, Coşkun Y<sup>1</sup>, Turkyilmaz S<sup>1</sup>, Güler S<sup>1</sup>, Buzgan T<sup>1</sup>, Besler HT<sup>1</sup>

<sup>1</sup>Hacettepe University, Faculty of Health Sciences, Department of Nutrition and Dietetics.

\*Contact: baksoy@hacettepe.edu.tr

**Introduction:** Diet protein quality is not only affected by protein intake and type but also socioeconomic indicators. Turkey is one of the countries with the largest decrease in income per capita of rural regions among OECD countries. Evaluation of diet protein quality is important for the body to satisfy protein synthesis for growth and maintenance. **Methods:** A subgroup of 5429 healthy adult men (n=2094) and nonpregnant women (n=3335) aged between 18-64yrs was selected from the study of Turkey Nutrition and Health Survey (TNHS) 2010. Individuals were separated as urban (n=3625) or rural (n=1804) according to household demographic status. Protein intake was represented as Mean, SE using IBM SPSS Complex Samples. Digestibility corrected amino-acid score (PDCAAs) method was used to evaluate diet protein quality. In calculating PDCAAs 24-hours dietary recall was based on. **Results:** Mean total dietary protein intake was found 61.1±0.7g/day and

62.3±1.0g/day in urban and rural adults respectively. Mean dietary animal and plant protein intake was found 29.2±0.6, 26.5±0.7g/day and, 31.9±0.4, 35.7±0.6g/day for urban and rural adults respectively. PDCAAs was found 0.92 in urban and 0.91 in rural adults and Lysine was found to be as limited amino acid for both urban and rural individuals. **Conclusions, discussion and/or practical application:** The results shows that although mean total dietary protein intake was greater in rural adults, PDCAAs score was found to be greater in urban adults. This results may suggest that animal protein intake has a potential importance for improving diet protein quality. Our results are also in accordance with previous studies that highlights protein quality is as important as protein quantity.

**COMPETING INTERESTS:** The authors of this document can confirm there is no conflict of interests.





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## NEW FOODS AND FOOD TECHNOLOGY

## O-049: PROXIMATE COMPOSITION AND SHELF-LIFE OF SOUS-VIDE MACKEREL

Hande Dogruyol<sup>1,\*</sup>, Suhendan Mol<sup>1</sup><sup>1</sup>Istanbul University, Faculty of Fisheries, Department of Seafood Processing.

\*Contact: dogruyol@istanbul.edu.tr

**Introduction:** Sous-vide is a novel technique which offers economic and practical solutions for catering industry, enhances shelf-life of food and it's a proper cooking method for fish. The aim of this study was to determine the shelf-life of cold stored sous vide mackerel as well as its proximate composition. **Methods:** For sous-vide process, mackerel fillets were vacuum-packed and cooked in a water bath (70°C, 10 min) followed by immediate chilling, then stored at 2°C. Proximate composition was determined by moisture, ash, crude protein and fat content analyses. Carbohydrate and energy values were calculated. Total aerobic (mesophilic and psychrophilic) and anaerobic bacteria counts were determined. Sensory evaluation and physicochemical analyses (TMA-N, TVB-N and TBARs) were carried out weekly. **Results:** Sous-vide process did not significantly affect the proximate composition and energy value of mackerel. The initial sensory score of the sous-vide fillets was excellent. Due to sensory evaluation, fillets were acceptable on the 6<sup>th</sup> week of cold storage, then

spoiled. However, TVB-N values and microbial loads were above the limits at the same week. **Conclusions, discussion and/or practical application:** According to our proximate composition analyses, mackerels maintained their quality after sous-vide processing. However, Gokoglu *et al.* (2004) reported significant changes in proximate compositions of rainbow trout, cooked by other methods. Likewise, conscious dietitians mostly suggest sous-vide fish (Mol *et al.*, 2015). As to shelf-life analyses, our sensory scores were still acceptable while total aerobic load were above the limits on the 6<sup>th</sup> week. So the shelf-life of sous-vide mackerel was determined as 5 weeks. Similarly, Cosansu *et al.* (2011) and Mol *et al.* (2012) stated that the shelf-life of sous-vide bonito stored at 4°C was 5 and 4 weeks, respectively. Sous-vide mackerel, having a shelf-life for more than a month, would be a healthy option and low-calorie choice with high sensory quality.

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## O-050: RAPESEED OIL AND SEA BUCKTHORN, NATURAL INGREDIENTS TO PREVENT LIPID OXIDATION IN PROCESSED MEAT

Lucía Redondo Cuevas<sup>1,\*</sup>, Gloria Castellano Estornell<sup>2</sup>, Philip Morrice<sup>3</sup>, Wendy Russell<sup>3</sup>, Garry Duthie<sup>3</sup>

<sup>1</sup>Escuela de Doctorado. Universidad Católica de Valencia San Vicente Mártir, 46001 Valencia, Spain. <sup>2</sup>Departamento de Ciencias Experimentales y Matemáticas, Facultad de Veterinaria y Ciencias Experimentales, Universidad Católica de Valencia San Vicente Mártir, 46001 Valencia, Spain. <sup>3</sup>Natural Products Group, Rowett Institute of Nutrition and Health, University of Aberdeen, Aberdeen AB21 9SB, UK.

\*Contact: lucia.redondo.cuevas@gmail.com

**Introduction:** Lipid and protein oxidation decreases shelf-life of foods and may result in formation of end-products potentially detrimental for health. Consumer pressure to decrease the use of synthetic antioxidants has encouraged identification of alternative natural products. Numerous vegetables and

even exotic plant species have been investigated as potential sources of natural antioxidants for food applications; however, little attention has been directed at indigenous Scottish plants, such as sea buckthorn (*Hippophae rhamnoides* L.), as antioxidants sources currently underused but whose widespread cultivation

could lead to economic and health benefits. **Methods:** An assessment was made of whether inclusion of dried powder of sea buckthorn improves the oxidative stability of turkey meat burgers. At the same time, burgers were made using different oils, namely rapeseed, virgin olive, sunflower and coconut oil. The oxidative stability of the burgers was analyzed in an accelerated oxidation system (Rancimat). Possible *in vivo* effects were determined in simulated digestion measuring TBARS by HPLC. **Results:** Rapeseed oil despite having the poorest stability as individual oil, its incorporation produced the most oxidative

stable burgers (statistically significant) in both oxidative stability and digestion systems. Inclusion of sea buckthorn in burgers markedly extended shelf life and also inhibited lipid oxidation during simulated digestion. **Conclusions, discussion and/or practical application:** Reformulation of processed meat to include dried sea buckthorn powder and also the use of rapeseed oil offers an alternative strategy to prevent lipid oxidation and increase self-life of these products.

**COMPETING INTERESTS:** The authors of this document can confirm there is no conflict of interests.

## O-051: EFFECT OF MICROWAVE IRRADIATION VS. HEATING BY CONVENTIONAL METHOD ON THE EGG WHITE ANTIGENICITY

Hanane Kaddouri<sup>1,\*</sup>, Hafsia Abbas<sup>1</sup>, Omar Kheroua<sup>1</sup>, Djamel Saidi<sup>1</sup>

<sup>1</sup>Laboratory of Physiology of Nutrition and Food Safety, Department of Biology, Faculty of Sciences of Nature and Life, University of Oran 1, Oran, Algeria.

\*Contact: hanane72@yahoo.fr

**Introduction:** Thermal processing of food is a common practice. Heating induces several chemical and physical changes in food proteins. Microwave irradiation (MWI) is an alternative method to a conventional heating. Although MWI effects on some food proteins were studied, there is a lack of information about its effect on antigenicity. The purpose of this study was to determine MWI effects on the antigenicity of egg white proteins compared to conventional heating effects. **Methods:** The egg white reconstituted in phosphate buffer was submitted to microwave irradiation or heated by conventional method. Egg proteins alteration was assessed with sodium dodecylsulfate-polyacrylamide gel electrophoresis (SDS-PAGE). Antigenicity of the egg white major protein (ovalbumin) in the heat-processed samples was determined by enzyme linked sorbent assay

(ELISA) using mouse polyclonal antibodies raised against ovalbumin. **Results:** SDS-PAGE patterns of processed (by microwave irradiation or conventional method) samples showed no differences from that of the control. ELISA assays that used mouse polyclonal antibodies IgG indicated antigenic stability of ovalbumin to MWI when compared with that of the unprocessed counterpart. Whereas, heating by conventional method led to a significant reduction in ovalbumin antigenicity. **Conclusions, discussion and/or practical application:** Ovalbumin antigenicity is stable to MWI but significantly reduced by heating using conventional method.

**COMPETING INTERESTS:** The authors of this document can confirm there is no conflict of interests.

