Full oral papers in program order
Conference Day 1
Wednesday 5 September 2012

Session 1
PLENARY: DIETITIANS AS LEADERS, PAST, PRESENT AND FUTURE

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Dietetics as a form of study predates medicine, but the profession did not emerge until the 19th century and is still in an emergent stage today in many parts of the world. This paper seeks to demonstrate how the impact of leaders has been critical in terms of the growth and development of the profession. The published literature is silent on many aspects of dietetics. In modern times, the majority of written works have come from North America and Western Europe. No work on historical or developmental aspects of dietetics from other parts of the world could be located. Leadership within the profession is well researched, but leadership by the profession in the broader arena of national and international policy and practice is harder to identify. There are calls for curricula to keep pace with the needs of modern healthcare systems if the profession is to flourish. Despite all the changes and the evolution of the profession, much remains unchanged. There are recurring themes throughout the literature reviewed here, those of the breadth of dietetics, the need for evolving curricula, the need for business acumen, the need for diversity and, in more recent times, the ability to work with interdisciplinary teams. But the profession has what it takes. It has within its ranks leaders of today and tomorrow. It is up to the profession to allow those leaders to emerge and take the profession to the next level.

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PLENARY: ICDA LECTURE: EDUCATION AND WORK OF DIETITIANS ACROSS THE WORLD

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In working to deliver the mission of the International Confederation of Dietetic Associations (ICDA), in particular, "to increase awareness of the standards of education, training and practice in dietetics" the ICDA Board has undertaken a number of surveys of the education and work of dietitians. In April 2012 the 42 National Dietetic Associations (NDA) who are members of ICDA were surveyed. Questions asked related to the membership of the NDA, minimum education requirements to practice as a Dietitian, continuing professional development required post qualification to continue to practice and areas of work. The results from the survey will be presented and any changes and trends seen over the last 10 years will be discussed. A report of the findings will be published on the ICDA website – http://www.internationaldietetics.org

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Morning Concurrent Sessions – Session 2
2.1 Professional Associations, Regulation and Registration
LEAD SESSION: THE DIETETICS BALANCING ACT: SHOULD WE BE LONERS OR JOINERS?

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This presentation addresses the dilemma dietetics faces in *LEAPing* forward: Is perfecting dietetics by activities within dietetic associations (loner strategy), proactively collaborating with other associations with more diffuse goals and a broader memberships (joiner strategy), or a hybrid strategy optimal? The "loner" strategy provides a forum for dietetics to develop a clear and realistic view that can be endorsed by the larger society of who dietitians are, what they can do best, and why they deserve privileged professional roles, as ICDA position papers outline. In some countries, dietetics as defined by ICDA standards does not exist, and likely will not emerge until a persuasive case can be made about the unique societal role of dietetics in helping to deal with the risks and realities of common diet-related and food-borne diseases, aging, and quality of life. Other *LEAP* goals require dietetic "joiner" strategies since diet is only part of medical and public health problems and solutions. Health policy and practice advances have resulted chiefly from multidisciplinary interaction, integration, harmonization and political leverage. "Joiner" strategies are effective in advocating provision of adequate food and nutrition for the human race, working to decrease the multifactorial risks involved in chronic degenerative diseases and aging, translating basic biological research into practice, and developing systematic evidence-based reviews and practice guidelines. Barriers facing dietitians and their associations will be discussed and a way forward suggested. The optimal balance between loner and joiner strategies depends on the goals to be achieved. ICD 2012 highlights the need for a hybrid strategy and provides delegates with opportunities to develop it.

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236. MEMBER SATISFACTION WITH CANADIAN DIETETIC ASSOCIATION PROGRAMS AND PRIORITIES

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In February 2011, Dietitians of Canada (DC) conducted an online survey of its members for the purpose of determining their satisfaction level with association priorities, programs, and the advocacy agenda. A marketing and data analysis firm drafted the survey questions and tabulated the results. A member review committee tested the survey tool. The online survey was announced to all DC members (n = 6000) by e-mail and two reminders were sent at one and two weeks. The response rate was 22%. A five-point scale was used and seven open-ended questions were asked. Overall, 76% of respondents were satisfied with their professional association and 81% indicated they benefited from being a member. Almost all members felt the four association priorities were important and 62 to 76% were satisfied with the role DC played in each. There was strong support for the issues on the advocacy agenda

with 72% being satisfied with DC's efforts to engage them in the development of the profession's view on issues. The top named 'one program' respondents found most valuable was Practice-based Evidence in Nutrition with 66% reporting access to this online global resource for nutrition practice, and 92% finding it useful. The most mentioned 'one thing' the association could improve to add value for members was increase accessibility and affordability of professional development. DC will use the results to refine association priorities and programs to bring increased value for members.

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509. NEW LICENSING SYSTEM FOR CLINICAL DIETITIAN IN KOREA

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Korea became an aging society because of the aging population and low birth rate. Prevalence of chronic degenerative diseases is increasing. To promote health and prevent diseases, the Korean government recognized the importance of nutritional care. In Korea, licensed dietitians are trained and worked at schools, hospitals, public health centres, food service organizations etc. To do nutritional care, there are needs for more trained clinical dietitians. With the newly established Nutritional Management Act, the new program for clinical dietitian is formulated. Before this new program, the Korean Dietetic Association (KDA) gives certification for clinical dietitian with a special education program. With the new program, the clinical dietitian has to complete the Master's course in the certified universities, including an intern program at the hospital and health centre. After finishing courses and intern program, they have to pass the examination to be the clinical dietitian. To certify the educational institution and to execute licensing examination, KIDEE is founded as of March 11, 2011 and established as the juridical foundation. Main organizer for the KIDEE is the Korean Dietetic Association with help of universities. Currently KIDEE is preparing to certify university programs for clinical dietitian. Also to acknowledge old certificates for clinical dietitian, KIDEE is preparing to carry out the special examination for the licenses. With the new system for clinical dietitian, Korean people can have the confidence they will have good nutritional care.

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2.2 Public Health Policy

LEAD SESSION: DIETITIANS IN RESEARCH AND PUBLIC POLICY

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Nutrition and Dietetics is an evidence based practice. The use of scientific evidence in practice extends from the context of healthcare delivery through to the development of public health policy. Thus dietitians are engaged with research throughout the full course of their careers, but the nature of this engagement will vary depending on circumstances. This presentation argues for the value of dietitians leading their own research pathways, and in collaborative partnerships. This position is particularly significant when it comes to contributing to public health policy where research capacities are needed to appraise a broad evidence base and reach conclusions that make sense. The dietitian with primary research experience has a unique contribution in not only being able to critique the research but also bringing a deep appreciation of what is required in translation. This can occur at a number of levels. In identifying the questions that are important for practice, dietitians have an understanding of population sub-groups, relevant health outcomes, nutritional and dietary variables and the parameters of dietary variables, such as food categories and serve sizes. When it comes to critiquing the research, experience in conducting research provides additional insights. This may be at the design level, for example in intervention trials, but it could also come from participating in systematic literature review methodology, which is also a form of research. Developing formal research competencies should form part of the career development plan of dietitians today, particularly those who see public health policy as a goal for the future.

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480. A CASE STUDY APPROACH TO UNDERSTANDING SCHOOL PERSPECTIVES ON NUTRITION POLICY IMPLEMENTATION IN MANITOBA

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Child nutrition is a concern in Manitoba with 31% of children being overweight and 15% experiencing inconsistent access to food. Public consultations identified improving access to healthy foods at school as a key action. As a response, the Manitoba Government directed that all schools in Manitoba institute school nutrition policies (SNPs). To obtain a comprehensive understanding of SNP implementation issues from the perspective of the school community, and to identify barriers/enablers of policy implementation, a qualitative case study was conducted, to explore the perceptions of eight distinct key informant groups (administrators, parents, teachers, students, education assistants, custodians and food service personnel). Cases comprised three schools (one inner-city; one suburban elementary; and one secondary school) within one school division in the city of Winnipeg, Manitoba. Methods included semi-structured interviews, focus groups, observations of the school environment and collection of documentation (e.g. policies, and newsletters). The use of multiple key informant groups provided insights into differing and sometimes conflicting perspectives within the school community. Three overall themes related to barriers to implementation were identified: negative attitudes toward nutrition and SNP; limited school and community capacity; lack of communication. Within each theme sub-issues were found that were either cross-cutting or else specific to a single school. The importance of contextualizing SNP implementation was evident, as each school faced challenges related to its specific organisational and community situation. The findings help practitioners and policy makers understand what is needed to support schools in successfully implementing SNPs.

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695. FOOD FORTIFICATION: THE EVIDENCE, ETHICS AND POLITICS

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With advances in scientific knowledge, improvements in food technology and the identification of novel applications, food fortification has burgeoned internationally. But, should we assume that food fortification policy and practice are always evidence-based?, ethical?, and free of political influence? The purpose of this paper is to present findings from an extensive food policy analysis study to help answer these questions. The method used was a critical analysis of the policy-making processes, their outcomes and impacts for individuals and society for four particularly rich case studies of food fortification: voluntary food fortification; mandatory folic acid fortification; iodine fortification; and vitamin D fortification. Data were collected from key informant interviews and documentary analysis. The results that emerge from the policy analyses challenge the rational-linear model of policy-making for these case studies. Instead, it is critical elements of framing theory and the advo-

cacy coalition framework that more accurately explain and predict food fortification policy and practice. The principle conclusions are the need for a clear definition of 'protecting public health and safety' in food regulatory systems internationally; the need for improved governance arrangements to manage decision-making processes, e.g. greater transparency and more accessible participation opportunities for the public; and greater investment in enforcement, monitoring and evaluation activities.

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2.3 Frameworks for Research in Practice

700. USING SOCIAL PRACTICE THEORY TO ADVANCE DIETETIC PRACTICE

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Social practice theory is being used to explain everyday life practices such as cooking and eating. Globally there has been concern that a deskilling in cooking is contributing to obesity rates. Dietitians are regularly involved in delivering cooking skill interventions (CSIs) such as demonstrations. This involvement is in contrast to the lack of published evidence on the effectiveness of CSIs. There is a need to investigate cooking practice and CSIs to examine how effectiveness can be maximized. Research was undertaken to (1) critique the assumption of value in using CSIs in public health nutrition programs, (2) assess the cooking skills and health discourses in everyday life of CSIs participants and (3) appraise CSIs delivery. Semi-structured interviews were conducted with 21 CSIs participants, 19 practitioners and 4 observations of CSIs delivery were undertaken. Interview and observational analysis was informed by grounded theory methodology. Practice theory was used as the theoretical lens to examine themes derived from analysis. Three types of cooking practices emerged from the analysis. The first can be described as an experimental/enjoyable practice, the second as a routinised/reassuring practice and the third as a problematic/stressful practice. CSIs delivery did not fully consider the breadth of elements in these three practices. CSIs participants articulated their inability to respond to CSIs. Dietitians must first understand how practice elements are developed and transformed in everyday life in order to change practices such as cooking to improve diet quality. Social theory application is useful to produce evidence for improving dietetic practice.

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332. CRACKING A NUTTY THEORY: SYSTEMATIC REVIEW AND META-ANALYSIS

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Numerous published studies suggest that a modest daily intake of nuts, improves lipid profiles, blood glucose control and weight management, thereby lowering the risk of chronic diseases. Recent meta-analyses have yielded conflicting results with walnuts (high in polyunsaturated fatty acids) reported to lower total and LDL-cholesterol, while almonds (mainly monounsaturated) were reported from analysis of five studies to have neutral effect.

There has been no truly comprehensive statistical analysis of published dietary intervention studies. Hence a meta-analysis of nut studies was undertaken using the Comprehensive Meta-analysis statistical analysis software. Sixteen walnut studies (427 subjects) and 10 almond studies (464 subjects) were identified. In all, there were 32 studies with nuts which had predominantly monounsaturated fatty acids (959 subjects). Nut supplementation decreased total cholesterol (–0.321, $p < 0.001$), LDL-cholesterol (–0.302, $p < 0.001$), and triglycerides (–0.065, $p = 0.002$), but had no effect on HDL-cholesterol (0.013, $p = 0.336$). Macadamia nuts, a uniquely Australian product and very high in mono un-saturates, were investigated in 6 studies (143 subjects) they decreased total and LDL-cholesterol (–0.352, $p = 0.013$ and –0.310, $p < 0.001$ respectively), but were without effect on HDL-cholesterol or triglycerides. In conclusion, nut supplemented diets decrease both total- and LDL-cholesterol, and additionally have a modest triglyceride lowering effect. Therefore it is recommended that nuts should be included as part of a dietary portfolio to manage weight, blood glucose and lipids due to its high satiety, ease of availability, better shelf-life (compared to fresh fruit and veggies), as well as many other nutritional benefits.

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671. ENHANCED WELLBEING – WHAT IS MEANINGFUL FOR PARTICIPANTS IN A DIETARY WEIGHT-LOSS INTERVENTION TRIAL

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Excess weight and recognised implications for chronic disease feature strongly within social and public health discourse over the last decade yet rates of overweight/obesity have escalated. Concurrently dietary weight-loss interventions studies have primarily focussed on energy/macronutrient manipulations and impact on measurable physiological and biochemical outcomes. Identifying factors meaningful to individuals for improvement in overall wellness/wellbeing by contrast has received limited attention. Identify perceptions of participants on utility of wellness and wellbeing concepts within a dietary weight-loss intervention. Semi structured interviews were conducted at two time points (0–3 months $n = 117$, and 9–12 months $n = 61$). Variables explored included: reason for involvement; self-identified opportunities/barriers; perceptions about wellness/wellbeing concepts and relevance for weight loss. Verbatim transcribed interviews were examined using inductive thematic analysis to describe responses. QSR Nvivo 8 software package supported data management. Anthropometric and biochemical data were also tabulated. Holistic health embedded within wellness/wellbeing concepts for better quality of life was the overarching theme compelling individuals to engage in weight-loss behavioural change. Six key themes and 18 subthemes were identified across the two time points. Achievability of food prescription was perceived to be influenced by time constraints, significant others and work/life obligations. Food choice motivation centred on accountability (social responsibility), improved physical appearance (social acceptability), and beliefs about health and wellbeing (capacity building). Individuals' acknowledge holistic changes to health are meaningful and critical in supporting behavioural changes for weight loss. Further research personalising interventions to identified factors supporting individuals' perceptions of wellness/wellbeing is warranted.

Funding source: NHRMC project grant (514631) Tapsell, Batterham, Charlton and Smart Foods Centre, University of Wollongong, Wollongong, NSW 2500 Australia

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291. RE-EVALUATION OF WOMEN'S NUTRITIONAL NEEDS, KNOWLEDGE, AND BEHAVIOURS IN A TERTIARY MATERNITY SERVICE: ARE WE MEETING WOMEN'S NEEDS YET?

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Prior to dietetic service changes in the Mater Mothers' Hospital (MMH) in 2008, women attending the antenatal (AN) clinic and postnatal (PN) ward were surveyed to assess their diet quality, pregnancy/nutrition-related knowledge, importance, behaviour, and education preferences. Following evidence-based (EB) changes, including nutrition in pregnancy booklet, early AN group, and integrated weight management program, we re-surveyed women to inform ongoing service development. For seven weeks during 2011 we surveyed MMH patients to assess key areas of interest, with previously used tools. The 356 AN and 138 PN women (RR 47.5%; 24.2%) had similar demographic, anthropometric and pregnancy characteristics to the 2008 cohort (RR 24%; 17.4%). Approximately half were primiparous and over one third had a BMI >25 kg/m². However in 2011, women had lower gestational weight gain (GWG) (12.8 ± 5.2 kg vs 14.5 ± 6.3 kg, $p = 0.04$), more knew correct GWG guidelines ($p = 0.005$) and fewer had excessive GWG across all BMI categories ($p < 0.05$). Whilst similar proportions reported receiving written information in 2011, more liked the look of the new booklet ($p < 0.001$), found it useful ($p = 0.003$) and knew of nutrition services available ($p < 0.001$), compared with the 2008 cohort. However, similar proportions accessed the nutrition services at both times. Those who did felt the service met their needs. At both times, women had poor diet quality, despite identifying healthy eating as a high priority. EB service changes at the MMH have effected positive change in women's GWG and service preferences. However, targeted, intensive interventions may be required to improve diet quality and manage GWG to ensure optimal pregnancy outcomes.

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2.4 International Challenges
LEAD SESSION: CHALLENGES FOR NUTRITION IN DEVELOPING COUNTRIES

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The challenges for nutrition in developing countries, and specifically in Africa, are huge and related to the whole spectrum of education, training, policies and practice of nutrition. In addition to a constant need for food aid in politically unstable and war-torn countries, poverty, natural disasters, bad governance, and the present nutrition transition in developing countries suffering from food and nutrition insecurity, have resulted in the co-existence of under- and over-nutrition, exacerbating an already difficult situation. A major obstacle to address these nutrition problems in developing countries is the lack of an integrated approach. The purpose of this paper is to suggest a conceptual framework that can be used to integrate the functions and roles of all stakeholders in public-private partnerships around a common, ethical agenda to address food and nutrition security in a way that will enable consumers to make healthy food choices in a food environment where these choices are safe, available, culturally acceptable and affordable. Because of the central role of poverty in nutrition insecurity, and the fact that the intergenerational poverty-malnutrition cycle can only be broken or alleviated when nutritional status of the population is optimized, it is further suggested that the starting point for planning appropriate interventions is to integrate structures and functions of all Governmental departments and sectors involved in food and nutrition security under a central, trans-disciplinary, trans-sectorial Ministry of Nutrition or a similar authoritative agency.

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49. PREVALENCE OF OVERWEIGHT AND OBESITY AMONG CHILDREN 6–10 YEARS OLD IN THE NORTHEAST HEALTH REGION (NEHR) OF JAMAICA

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Adult obesity is a major public health problem which may have its roots in childhood. Investigation of overweight/obesity among children may reveal opportunities for intervention and possible prevention of obesity in later life. This project aims to estimate the prevalence of overweight/obesity among children 6–10 years old in the NEHR, Jamaica. Weights and heights were assessed for 5711 children 6–10 years old in 34 schools in the NEHR (St Ann, St Mary and Portland) between October 2008 and March 2009. School location (urban/rural) and type (public/private) were noted. Overweight and obesity were defined as BMI z-score >+1 and >+2, respectively based on WHO growth standards. Prevalence estimates were obtained using SPSS Version 17.0. Boys comprised 49.6% of the sample. Overweight and obesity prevalence were 10.6% and 7.1%, respectively. The prevalence of overweight was significantly ($p < 0.001$) higher among girls (12.5%) than boys (8.7%). The prevalence of overweight increased significantly with age ($p < 0.001$) being 8.4% at 6 years and 12.6% at 10 years. Both overweight and obesity were significantly higher ($p < 0.001$) in urban (16.2% and 13.1%, respectively) vs. rural schools (8.4% and 4.7% respectively); and were more common in private (22.7% and 16.2%, respectively) vs. urban public schools (13% and 11.7%, respectively). The prevalence of overweight/obesity among 6–10 years old is high in the NEHR of Jamaica with girls having higher risk than boys and urban children having higher risk than their rural counterparts. Appropriately targeted interventions are needed to combat this problem.

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342. BODY FAT PERCENTAGE AND ITS CORRELATION WITH BMI, DIETARY PATTERN AND PHYSICAL ACTIVITY OF SCHOOL GOING CHILDREN FROM DIFFERENT SOCIOECONOMIC STRATA OF MUMBAI CITY

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Indian children suffer from dual burden of malnutrition. The BMI percentiles may not reflect adiposity in children at both the ends of spectrum. The aim of the study was to estimate body fat percentage of school going children of different socioeconomic strata and to compare BMI percentiles and body fat percentage, to identify lean obese and to correlate body fat percentage with dietary habits and physical activity. The sample comprised of 764 school going children 9–17 years old coming from private and government school of Mumbai. Standardized methods were used for anthropometric measurements, body fat estimation done with TANITA Body fat analyser and other information through pretested standardized questionnaire. The results indicate a

distinct increase in the number of children with high body fat percentage even in normal BMI category in Lower socioeconomic strata. Additionally the percentage of overweight and obese children increased in High socioeconomic strata when body fat was used as criteria. Body fat was positively correlated to quality of eating including quantum of refined flour bakery products, eating out frequency, regular breakfast consumption, duration of sleep, TV viewing and level of physical activity. It was negatively correlated to salad consumption, fruit and milk consumption. The study gives insight on body fat composition of Indian children its relationship to dietary pattern and lifestyle factors.

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2.5 Evidenced Based Practice
LEAD SESSION: DEVELOPING A 'TASTE' FOR BEST EVIDENCE

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Most practice decisions are made on the basis of some form of evidence. However, some evidence is better than others, some findings more valid than others, some information more deserving of our attention than others. Poor study design, weak evidence, wrongly interpreted evidence, or missed evidence can have significant and sometimes catastrophic consequences on outcomes. This is true in the practice of dietetics as it is in many other areas of life.

We must develop strategies to filter out the noise of massive amounts of questionable information. We must seek the best and most relevant evidence available, often in the face of uncertainty. This short presentation will provide practical pearls regarding how to recognize good and bad evidence. It will explore how our own ways of thinking, learning and processing of information can influence where we look for information, what that information "tells us" and whether we incorporate it into our practices. We will also explore why evidence is never enough. The complexity of the problem, the uncertainty of the evidence, patient values, our own experiences as well as organizational or community influences all play a role in how we incorporate evidence into our practice decisions. Participants will leave with tools and insights that will inform how they approach, and ultimately use, best evidence.

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533. USING A WEB-BASED WIKI PLATFORM TO DEVELOP EVIDENCE BASED PRACTICE GUIDELINES TO MAINTAIN CURRENCY

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A number of evidence based practice guidelines for nutrition and dietetics have been developed in Australia and endorsed by the Dietitians Association of Australia However, maintenance of guideline currency has been problematic with newly published studies requiring addition to the body of evidence which may alter the original recommendations. The aim of this project was to develop guidelines using a web-based wiki platform to enable collaboration, rapid updates, version control and online public consultation. The trial was used to develop evidence based guidelines for the nutritional management of patients with head and neck cancer. Traditional guideline development methodology was used with critical appraisal of the literature following the National Health and Medical Research Council (NHMRC) levels of evidence and the American Dietetic Association (ADA) methodology to rate the quality of the study design. The body of evidence was assessed using the NHMRC grades of recommendations. Technological support was obtained through the Clinical Oncological Society of Australia to translate the completed draft guideline document into a format suitable for publication on a wiki platform. This was made available on a public website for consultation, facilitating broader dissemination to international stakeholders. Comments were collated directly on the website and the authors were able to post replies to advise how comments had been addressed. In summary, this methodology proved to be successful and updates to the guidelines as new evidence becomes available can easily be made ensuring the document remains current and valid. This approach is recommended for future development of guidelines.

Funding source: Cancer Institute New South Wales Oncology Group (NSWOG) – Head and Neck

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319. UPGRADING THE DIETETICS CURRICULUM WITH CRITICAL THINKING, EVIDENCE-BASED PRACTICE AND RESEARCH COMPETENCIES

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Dutch dietitians have traditionally been educated as clinical and primary care dietitians. More recently marketing and public health have been added to the curriculum. Current developments require higher standards with regard to evidence-based practice and research competencies. To improve graduation standards and facilitate research collaborations with professionals in practice we developed and implemented a multidisciplinary curriculum upgrade for all three BSc programs within the Academy of Health (i.e. nursing, nutrition & dietetics, skin therapy). Research skills mainly focus on practice-oriented research (including both qualitative and quantitative research) and evidence-based practice skills includes finding, reading, interpreting, and implementing a broad variety of scientific publications. As basic skills to accomplish this we identified English language reading and critical thinking skills. English academic reading includes an e-learning module (MyReadingLab, Pearson), integration in other courses, and a journal club course. Critical thinking consists of computer labs using Rationale (Austhink Software) and integration in other courses (e.g. dietetic case studies). Research and evidence-based practice skills are integrated in the curriculum from the first year onwards with increasing complexity. Qualitative research on the perceptions and attitudes of our Nutrition & Dietetics students with regard to evidence-based practice and research competencies in the curriculum and their self-efficacy is ongoing. In 2009–2010 semi-structured, audio-recorded qualitative interviews were conducted with six third-year students. In study year 2011–2012 another 12 second and third year students will be interviewed using the same topic list. Results will be analysed in relation to the curriculum upgrades.

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2.6 Clinical Paediatric Nutrition
LEAD SESSION: OMEGA-3 LONG CHAIN POLYUNSATURATED FATTY ACIDS: THE FATS OF LIFE

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The metabolic demand for omega-3 long chain polyunsaturated fatty acids, particularly docosahexaenoic acid (22:6 omega-3, DHA), is increased during pregnancy because of the extra needs of the foetus, expanded maternal cell mass and placenta. However, maternal dietary DHA intake in pregnancy is low and it is not clear whether adaptive

metabolic mechanisms are capable of meeting the increased DHA need in pregnancy. What is clear is that preterm infants are at greater risk of DHA depletion than their term born counterparts because they are born before they have had the opportunity to accumulate a full complement of DHA. This is well illustrated through our recent trials, one involving preterm infants (the DINO trial) and another involving pregnant women who largely gave birth to term infants (the DOMInO trial). The DINO trial showed that supplementation which aimed to achieve the concentration of DHA accumulated in the womb resulted in fewer infants with mild and significant cognitive delays at 18 months of age, although there were no differences in the mean developmental quotient scores. Such marked differences in neurodevelopmental outcome were not evident in the DOMInO trial. Further work is needed to better define the sub-groups of children who will benefit from DHA supplementation during the perinatal period.

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659. BARRIERS TO HEALTHY LIFESTYLES: THE CHALLENGE OF RACE/ETHNICITY AND A CULTURE OF POVERTY IN CHILDHOOD OBESITY

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Race/ethnicity, socio-economic, and environmental factors pose formidable influences on lifestyle choices in children, families and the community. In making headway in the fight for obesity, it is imperative that these influences be addressed. As part of the Healthy Lifestyles coalition, we investigated eating, physical activity, screen time access to healthy foods, and nutrition knowledge, attitudes and environmental influences, in three local schools with disproportionate rates of obesity (21–33% versus state, 20.7%), poverty (90–98% versus state, 45.4%), percentage black (79.1–83.6% versus state, 18.8%). Baseline quantitative and qualitative data collected in 2009 included results from a neighbourhood needs assessment, focus groups, body mass index assessments, Healthy Lifestyle questionnaires and school meal observations. Cost, convenience, taste and proximity of fast-food restaurants were major barriers to healthy eating; safety and "fun" activities to physical activity. Although 45% were classified as overweight/obese, only 23% perceived themselves as such. Only 24.5% consumed more than four servings of vegetables and fruit, 71% regularly consumed 1–2 sodas per day, and 69% regularly visited fast-food restaurants after school. The greatest influence on their food choices were parents and themselves. Only 20% of girls and 35% of boys reached physical activity recommendations, while 46% had 2–4 hours of screen time on school days. Despite 90–98% qualifying for free/reduced school meals, plate wastage was high, especially for fruit and vegetables. Continued data collection will enable us to monitor changes in response to structured, culturally sensitive strategies. Our paper will present an in-depth analysis of these barriers and their effect on obesity.

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357. COMPARISON OF THE PREVALENCE OF SHORT STATURE, UNDERWEIGHT AND OVERWEIGHT AMONG CHILDREN WITH DISABILITIES AGED 0 TO 10 YEARS OLD BY USING THE CDC 2000 AND WHO 2006/2007 GROWTH CHARTS

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Reference growth data is one of the essential nutritional screening tools used in paediatrics clinical settings to monitor growth and to identify those at risk for under- or over nutrition and to assess their response to treatment (Gibson R, 2005). The World Health Organization (WHO) growth chart is now recommended in Canada as the gold standard nutritional assessment tool of children. At Holland Bloorview, CDC growth charts has been used as a nutritional assessment tool since 2000. Therefore, validation of WHO growth chart in comparison with CDC growth charts is need to assess if same prevalence of short stature, underweight and overweight is identified in children with disabilities. The primary purpose of this study is to compare the prevalence of short stature, underweight, and overweight among children with disabilities aged 0 to 10 years old by using the WHO and CDC growth charts. Heights and weights from children with disabilities in the Child Development Program (CDP), Nutrition Clinic was recorded and plotted on CDC and WHO growth charts. This data was then statistically analysed and comparisons of prevalence of short stature, underweight and overweight based on the WHO and CDC growth chart. The results showed there are differences of in the prevalence of short stature, underweight and overweight among children with disabilities between CDC and WHO growth charts. Therefore, this would suggest that WHO growth charts will need further validation as primary nutritional screening tool for children with disabilities.

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2.7 Weight Loss Interventions

403. FACTORS INFLUENCING WEIGHT CHANGE IN OBESE ADOLESCENTS COMMENCING A WEIGHT MANAGEMENT PROGRAM

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The Cochrane review (2009) identified only 6 dietary interventions to treat childhood obesity in total providing data from only 350 individuals, thus the evidence base as to what constitutes 'success' is relatively small. The Eat Smart studies were designed to determine the cardiovascular and weight loss effects of a structured low fat versus a moderate carbohydrate diet during weight loss. 125 adolescents (69% female), mean BMI z score of 2.23, mean age of 13.2 years have completed 'Eat Smart' which incorporates the FRIENDS for Life program – a 6 week psychological intervention designed to increase coping skills. After 12 weeks, a mean reduction of 6.3% BMI z score was achieved (range from −0.45 to +0.01). Multivariate logistic regression explored change in BMI z score. Those benefitting the most from Eat Smart had a lower baseline BMI, lower fasting insulin, higher social advantage and were referred from a specialist. Dietary macronutrient composition was not a predictor of weight loss neither was physical activity. These results suggest that reduction in dietary carbohydrate could be an alternative dietary pattern for individuals not wishing to follow a low fat dietary pattern. Assessing factors associated with treatment outcome would allow clinicians in practice to individualise a weight management program or determine the 'best-fit' treatment for an individual in the light of their presenting characteristics.

Funding source: National Heart Foundation, ANZ Trustees, University of Queensland

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595. USING A NATIONAL CHILD HEALTH SURVEY TO ADVANCE CLINICAL WEIGHT MANAGEMENT SERVICES

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There is little evidence on which to base targeted clinical questions in paediatric weight management, or around which to formulate evaluation. We examined results from the *2007 Australian Child Nutrition and Physical Activity Survey* (n = 2,400 children aged 2–16 years), for lifestyle trends in children with obesity that could support these purposes. Family characteristics and estimates of nutrition and physical activity were used to compare results among three groups of age and sex match children; (1) average BMI (2) children with a BMI 1–2 SD above average and (3) children with a BMI >2 SD above average (SPSS, V17, USA). Results from chi-square analyses showed an overrepresentation among children in higher BMI groups; single parent families ($p = 0.05$), mainly non-English speaking families ($p < 0.001$), and low income families ($p = 0.002$). Following ANOVAs for the main effect of BMI group, energy intake did not differ among BMI age groups ($p = 0.28$) but markers of quality intake (vegetables, sugar, some fats) showed poorer trends within higher BMI groups. Screen time (television) increased with BMI group ($p < 0.001$) and pedometer steps, particularly at weekends, decreased with increasing BMI groupings ($p < 0.001$). The sociocultural context was reinforced as an important factor for knowledge translation and paediatric weight management. Greater BMI group differences were observed in physical activity /sedentary behaviour than nutrition. However, targeting quality over quantity of energy intake may be useful. This information may assist in guiding changed behaviours and in determining measures for evaluating effectiveness.

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405. EFFECT OF NUTRITION AND PHYSICAL ACTIVITY INTERVENTION ON OBESITY PREVENTION IN PRIMARY SCHOOL IN HO CHI MINH CITY VIETNAM

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In the recent years, the prevalence of obesity in primary school students increases significantly in Ho Chi Minh City (HCMC). The aim of this study was to evaluate the effect of healthy diet and increasing physical activity promotion on prevention and treatment of obesity in primary school students. This is a control community intervention study. The intervention was implemented in one school year 2008–2009 at two primary schools in district 10 HCMC with total number of 2500 students. Baseline measurement included weight, height, physical activity and dietary habits of students, knowledge of nutrition of students, teachers and parents, investigation of school lunch and food available at school canteens. Intervention included nutrition and physical education through lecture, education game, communication materials including video clip, leaflet, booklet; provide sport facility, implemented playground markings. The prevalence of overweight and obesity are high (20.8% and 7.7% respectively). Most of overweight and obesity students are males (67.1% and 91.7%). After one school year of intervention, the decrease in percentage of obesity in the intervention school is double compared with control school (8% and 3.9% respectively). After one year, in the intervention school, students have improved: good selection of milk, increase milk consumption, decease ice cream consumption, decrease sweet consumption, increase bicycle usage, increase exercise, decrease computer using for leisure purpose. Although the intervention duration is quite short, there is some improvement in diet and physical activity behaviours in students.

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199. COMMUNITY-BASED WEIGHT MANAGEMENT INTERVENTION IN ADOLESCENTS WITH ADDITIONAL THERAPEUTIC CONTACT: TWELVE MONTH OUTCOMES OF THE LOOZIT® RANDOMISED CONTROLLED TRIAL

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Adolescent weight management interventions in community-based settings are understudied. This study aims to report 12 month outcomes of the Loozit® adolescent weight management randomised controlled trial (RCT) and evaluate the effect of additional therapeutic contact (ATC) 12 months into the program. The Loozit® RCT is a 24 month, two-arm lifestyle intervention for overweight to moderately obese 13–16 year olds (BMC Public Health 2009; 9:119). In the first 2 months (Phase 1), adolescents and parents separately received 7 weekly group sessions focused on lifestyle modification. From 2 to 24 months (Phase 2), adolescents attended booster group sessions once every 3 months, with one study arm also receiving ATC every two weeks via telephone coaching or electronic communications. Primary outcomes were baseline to 12 month changes in BMI z-score and waist-to-height ratio (WHtR). Secondary outcomes included 12 month changes in metabolic, psychosocial and behavioural variables. Of 151 randomised adolescents, 82% completed 12 month follow-up. Intention-to-treat analyses showed significant reductions in mean (95% confidence interval) BMI z-score (−0.09 [−0.12, −0.06]), WHtR (−0.02 [−0.03, −0.01]), total cholesterol (−0.1 mmol/L [−0.2, 0.0]) and triglycerides (geometric mean: −0.9 mmol/L [−1.0, −0.8]). Most psychosocial outcomes improved but there were few dietary, physical activity or sedentary behaviour changes. There was no difference in primary outcomes between participants who did or did not receive ATC. The Loozit® RCT produced a significant but modest reduction in overweight and improved psychosocial outcomes at 12 months. The full impact of the intervention will be evaluated at 24 months.

Funding source: University of Sydney Research & Development Grant (2006); a bequest of the Estate of the late R.T. Hall (2006–2008); Macquarie Bank Foundation (2006–2008); Financial Markets Foundation for Children (2007–2008); and the Heart Foundation of Australia Grant-in-Aid (2009–2010). VS is supported by a National Health and Medical Research Council Biomedical Postgraduate Scholarship (#505009)

2.8 Nutrition Effects on Health
LEAD SESSION: ABSENCE OF CHD BENEFITS SPECIFIC TO LINOLEIC ACID IN RANDOMIZED CONTROLLED TRIALS

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Randomized controlled trials (RCTs) of mixed n-6 and n-3 PUFA interventions, and meta-analyses of their CHD outcomes, have been considered decisive evidence supporting recommendations to maintain or increase linoleic acid (LA) consumption. Here we (1) performed an extensive literature search and extracted detailed data enabling an examination of all RCTs that increased PUFA and reported CHD outcomes; (2) determined if PUFA interventions increased LA with specificity (LA-specific interventions), or increased both n-3 and n-6 PUFA (mixed-PUFA interventions); (3) compared LA-specific to mixed-PUFA interventions in meta-analyses; (4) evaluated the potential confounding role of trans-fatty acids (TFA). Four LA-specific and four mixed-PUFA datasets were identified. PUFA replaced a combination of SFA and TFA in all eight datasets. CHD risk was significantly higher in LA-specific compared to mixed-PUFA interventions (p = 0.02). For CHD events, the pooled risk reduction for mixed-PUFA interventions was 22% (RR 0.78; 95% CI 0.65, 0.93). There was a signal toward increased risk with LA-specific interventions (RR 1.13; 95% CI 0.84, 1.53), which may underestimate potential harm because it does not include the unfavourable results of the Sydney Diet-Heart Study (RR (death) = 1.49; 95% CI 0.95, 2.34). In pooled analysis of all four LA-specific datasets, there was a trend toward increased risk of death (RR 1.16; 95% CI 0.95, 1.42). Collectively, these RCT data indicate that different PUFA species have different effects on CHD, and that selectively increasing LA in place of SFA and TFA is unlikely to reduce CHD risk. Limitations and strengths of this RCT analysis will be presented in the context of evidence from other types of trials.

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107. EFFECT OF N-3 LONG CHAIN POLYUNSATURATED FATTY ACIDS (LCPUFA) SUPPLEMENTATION IN PREGNANCY ON INFANT ALLERGIES IN THE FIRST YEAR OF LIFE: A RANDOMISED CONTROLLED TRIAL

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Dietary n-3 long chain polyunsaturated fatty acids (LCPUFA) modulate neonatal markers of the immune response but there is uncertainty regarding the effect on clinical allergy outcomes. This randomized, double-blinded, controlled trial aimed to determine whether dietary n-3 LCPUFA supplementation of pregnant women with a foetus at high-risk of allergic disease will reduce infant allergic disease. The intervention group (n = 368) were randomly allocated to receive fish oil capsules (providing 900 mg n-3 LCPUFA daily) while the control group (n = 338) received matched vegetable oil capsules without n-3 LCPUFA from 21 weeks gestation until birth. Infant IgE-mediated allergic disease was assessed at one year of age. We found no differences in the overall percentage of infants with IgE-mediated allergic disease between the n-3 LCPUFA and control groups (32/368 (8.6%) vs 43/338 (12.7%); adjusted relative risk 0.70; 95% CI 0.45 to 1.09; *P* = 0.12), although the percentage of infants diagnosed with atopic eczema was lower in the n-3 LCPUFA group (26/368 (7.1%) n-3 LCPUFA vs 39/338 (11.7%) control; adjusted relative risk, 0.64; 95% CI 0.40 to 1.02; *P* = 0.06). Fewer infants were sensitized to egg in the n-3 LCPUFA group (34/368 (9.3%) DHA vs 52/338 (15.4%) control; adjusted relative risk, 0.62; 95% CI 0.41 to 0.93; *P* = 0.02), but there was no difference in IgE-mediated food allergy between groups. In conclusion, n-3 LCPUFA supplementation in pregnancy did not reduce the overall incidence of IgE-mediated allergies in the first year of life, although atopic eczema and egg sensitization were lower.

Funding source: Australian National Health and Medical Research Council (ID 399389) grant. Treatment and placebo capsules were donated by Efamol, UK

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423. FISH OIL ADMINISTRATION IN A HEALTHY ELDERLY POPULATION: IS THERE A POTENTIAL FOR ADVERSE EVENTS? A SYSTEMATIC REVIEW OF THE LITERATURE

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Despite increasing use of fish oil in higher medicinal doses, its administration remains largely unregulated and side effects are not well documented. This systematic review was designed to identify common side effects associated with the administration of fish oil to healthy older adults. Electronic databases including, but not limited to, MEDLINE and the Cochrane Library were searched for randomized controlled trials (RCTs) that included oral administration of fish oil to healthy older adults free from cardiovascular or metabolic conditions. Reviewed studies included fish oil (liquid or capsules) versus placebo or active matched control. 13 RCTs met these inclusion criteria. The daily dose for each study ranged from 0.3 to 3.7 g of EPA and/or DHA with duration ranging from 8–52 weeks. Few studies reported on side effects, the most frequently reported included diarrhoea (4 RCTs: n = 9/174; n = 3/124; n = 1/16), abdominal pain and bloating (3 RCTs: n = 3/46; n = 1/177; n = 1/46), burping/belching (2 RCTs: n = 15/52; n = 4/46) and nausea (1 RCTs; n = 5/52). Side effects were reported similarly across intervention and control groups. The review did not identify any serious unwanted effects associated with supplementation, irrespective of dose or duration. In particular, no increase in bleeding events was observed. Unwanted effects with fish oil were essentially confined to non-threatening gastrointestinal intolerance, which was also seen in the comparator groups. Evidence for the proposed health benefits of fish oil in healthy older adults appears to outweigh the potential for serious side effects.

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407. VITAMIN B12 STATUS AND COGNITIVE DECLINE, DEMENTIA AND ALZHEIMER'S DISEASE IN OLDER PEOPLE: A SYSTEMATIC REVIEW OF PROSPECTIVE COHORT STUDIES

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Poor vitamin B12 status has been linked to dementia and Alzheimer's Disease. Recent reviews have not assessed study quality or have not included newer biomarkers of vitamin B12 status. The present study systematically reviewed the evidence for associations between baseline vitamin B12 status and cognitive decline in subjects aged over 60 years.

A multiple database literature search to June 2010 was undertaken with keywords related to vitamin B12 and cognition. Quality assessment using the American Dietetic Association quality tool, and data abstraction were undertaken by two researchers. The search returned 2248 citations and 410 articles were retrieved. Nineteen cohort studies (subject n = 11,527) were identified; 12 of positive and seven of neutral quality. Studies were conducted over a median of five years; utilising a large variety of cognitive assessment tools with a median subject number of n = 516. No consistent relationship was found with only seven (six of positive quality) of 19 studies showing associations between baseline vitamin B12 status and cognitive decline or dementia. This lack of association may be due to the relative short duration of studies given the time for development of dementia; large number of potential confounders (e.g. education, diet, cardiovascular risk factors, APO<C->4 genotype) and inadequate subject numbers; infrequent use of sensitive biomarkers of vitamin B12 status and the broad range of cognitive tests that were used. Future studies need to consider statistical power, select an appropriate life stage and use sensitive biomarkers of vitamin B12 status and cognition to ascertain an effect.

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Afternoon Concurrent Sessions – Session 3

3.1 Scope of Practice 1

367. SUPPORTING DIETITIANS TO BECOME KEY MEMBERS OF INTERPROFESSIONAL PRACTICE TEAMS

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While dietetic practice is broad in scope, dietitians working in specialist areas want to become strong and influential members of interprofessional practice teams. Since 2010, Dietitians of Canada (DC) has collaborated with other non-profit organizations and professional groups to establish a series of intensive specialist practice education events in order to enhance the dietitian's role on teams in the areas of obesity management, sports nutrition and dysphagia assessment and treatment. Working with the Canadian Obesity Network, the Sports Dietitians of Australia, and influential dysphagia educators and clinicians from Australia, Canada and the United States, DC has created highly focused 3 and 4 day continuing professional education programming that brings together faculty from diverse disciplines who promote excellence in practice in these specialty areas and effective interdisciplinary practice. This session will present the evaluation results of those practitioners who have participated in these learning programs, the effect of these programs on the effectiveness of the role of the dietitians in their local practice teams in the short and medium term, and the perspectives of the collaborating organizations on the perceived benefits of interagency program planning. This session will be of interest to those organizations that wish to support advanced or specialist dietetic practice.

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673. NUTRITIONAL KNOWLEDGE AND NUTRITIONAL SERVICE BY NUTRITION ASSISTANTS AT GATOT SOEBROTO HOSPITAL

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The Nutrition assistant is the spearhead of nutrition services particularly at the hospital. The research objective was to determine the delivery of nutrition information, knowledge and application of serving food for patients by a nutrition assistant. This study is cross sectional. The study samples are the whole nutrition assistant at the inpatient ward. The independent variables are the characteristics of the nutrition assistant and delivery of nutrition messages by Nutritionist. The dependent variable is the nutrition knowledge and assessment. Data was obtained by carrying out observations, interview and the data were analysed by using Chi Square test (α 0.05). The result showed that the majority (69.4%) of respondent's ages was ≤35 years old, female 58.3%, tenure ≥3 years 80.6% and high school education 100%. There was a significant association between the sexes ($p = 0.002$), tenure ($p = 0.008$) providing technical information ($p = 0.002$), materials ($p = 0.044$), methods ($p = 0.000$), and time of delivery ($p = 0.000$) with the knowledge, except the age of nutrition assistant ($p = 0.888$). Moreover there is a significant association between nutritional knowledge ($p = 0.014$) with nutrition services. Odd ratio values shows (8.33 CI: 1.48–46.936) that respondents with nutritional knowledge ≥ cut off point, 8.33 times the chance to carry out the nutrition services better than the officers who have less knowledge of cut off point. To optimize the implementation of nutrition services, there should be more efforts initiated by Nutritionists to improve Nutrition assistant knowledge and service given to the patients.

529. ON THE EFFECTIVENESS OF HEALTH COACHING METHOD FOR ENHANCING THE CAPABILITIES OF HEALTH GUIDANCE PERSONNEL

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The aim was to verify the effectiveness of coaching in the improvement of skills and capabilities of health guidance personnel, such as health nurses and registered dietitians. We analysed the data from a questionnaire survey held in 4 different locations in Japan between February and March of 2011. In this unsigned questionnaire survey, 116 professional participants responded to all the items/questions after the seminar of the "Coaching Training Association." The results show that the skill proficiency of the responded participants in every item rose ($p < 0.01$). Moreover, those participants with 1–5 year incumbent experience had increased their awareness ($p < 0.01$), felt encouraged to have positive self-determination ($p < 0.01$), improved their active listening ($p < 0.05$) after having attended the coaching training. After the seminar, the respondents found that "Reframing" was the most useful skill acquired during the coaching lecture, which had a very high satisfaction rating. The results of the survey suggest that coaching guidance is effective in improving the leadership skills, particularly the one of the inexperienced participants and thus show that future seminars would be most helpful in promoting and improving their overall skills.

47. UNSUCCESSFUL INTERNSHIP APPLICANTS: A POTENTIAL LOSS OF HUMAN POTENTIAL FOR THE DIETETIC PROFESSION

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Completion of a post-graduate dietetic internship is one route by which dietitians may gain licensure in Ontario, Canada. However, a longstanding discrepancy between the number of applicants and the availability of internship positions means that each year up to two-thirds of those seeking entry to the profession do not receive internship positions. Little is known about this group. This study sought to answer three research questions: (1) What are the characteristics of applicants who apply, but are unsuccessful in securing an internship position; (2) What do applicants do after an unsuccessful internship application; and (3) What, if any, are the differences between those who have not obtained an internship position and those who were eventually successful? Internship applicants from 2005 to 2009 were invited to complete a 68-item online survey. The study sample (n = 84) was mostly homogenous: female (99%), heterosexual (98%), Caucasian (70%) and Canadian-born (75%). Seventy-three percent spoke English as a first language and over 40% were multilingual. The cumulative grade point average (x = 3.35) was above the minimum (3.0) required and 29% of respondents had completed a previous undergraduate degree. Just over one-quarter eventually secured an internship position. There was no significant difference between those who were eventually successful and the not yet successful applicants. Survey results indicate that unsuccessful applicants meet academic and relevant experience requirements for admission to dietetic internship programs in Ontario. This suggests that insufficient training opportunities create a loss of human potential in dietetics in Ontario.

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197. DIETITIANS ARE WILLING BUT UNSURE: A MODEL FOR PROGRESSING ABORIGINAL HEALTH WITHIN NUTRITION AND DIETETICS

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Aboriginal Australians experience nutrition related diseases such as kidney disease and diabetes at higher rates than non-Aboriginal Australians. Therefore, nutrition and dietetics can potentially have a large positive impact on the health of Aboriginal Australians. While this fact is recognised by dietitians and they are generally willing to work in the area, many consider Aboriginal health to be a complex area of practice. It is therefore pertinent to consider how dietitians might work most effectively in Aboriginal health. This qualitative study sought to explore the context in which dietitians practice in Aboriginal health, barriers to practice and how the profession might move forward. Twenty-one dietitians, working in South Australia, participated in a semi-structured interview based on these questions. Their experience working in Aboriginal health varied from zero to over twenty years. Dietitians identified factors that constrained and enabled their practice in Aboriginal health. These were classified as extrinsic (factors outside of the individual) and intrinsic (factors within the individual). A focus on intrinsic factors (including personal ideology, past experience and awareness of colonisation) was identified as one way that extrinsic barriers could be overcome. Dietitians were identified to pass through four stages in their practice in Aboriginal health including not knowing how to practice (Don't Know How), being too scared to practice (Too Scared), feeling that the area is too hard (Too Hard) and learning to practice regardless (Barrier Breaker). It was identified how dietitians can progress from one stage to the next, hence suggesting ways forward in Aboriginal health.

Funding source: Annabelle was supported by Australian Postgraduate Award and a 'top-up' scholarship from SA Health

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282. NATIONAL NUTRITION QUALIFICATION FOR FOODSERVICE STAFF

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Foodservice staff have a key influence on the nutritional quality of food eaten outside the home. Research identified a lack of nutrition training for food service staff, chefs and caterers, and the need for a national nutrition qualification targeted to their needs. This paper shares the development and implementation of a nationally-recognised training course and qualification for foodservice staff. The Heart Foundation (HF) partnered with the Hospitality Standards Institute to develop and pre-test resources the course training manual and resources, which were based on national nutrition guidelines. The course was offered to foodservice staff working in private and public hospitals, the New Zealand Military, the Department of Corrections, contract caterers, hotels, boarding schools and early childhood training centres and tutors in tertiary training institutes. In the first year over 1000 people had positively qualified and reported a greater awareness of nutrition in commercial catering. In 2011 it was the fastest growing foodservice qualification in New Zealand. The qualification is now being taught by registered training institutes throughout the country. The New Zealand Military has included it in the training of all chef trainees and as compulsory professional development for all qualified chefs. Secondary schools are able to teach the course to year 13 students in the Home Economics stream and student's evaluations will be presented. The HF continues to promote and encourage this qualification with the aim of providing healthier food outside the home.

Funding source: The Heart Foundation acknowledges the New Zealand Ministry of Health for funding for this project through The Food Industry Demonstration Pilot Programme

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242. FRAMEWORK FOR DIETETIC RECOGNITION BETWEEN COUNTRIES

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Globalisation is a phenomenon affecting all professions. Mutual recognition of qualifications between countries, particularly those with similarities in language, culture and health systems, may enable international mobility. The benefits of such exchanges are beyond those afforded to the individuals involved but also the broader profession allowing recognition of similarities and differences and ultimately cross fertilisation of ideas. The aim of this work was to establish a framework to facilitate mutual recognition which could be applied between any countries wishing to establish such an arrangement. The framework was developed based on outcomes of negotiations between the Alliance of Canadian Dietetic Regulatory Bodies and the Dietitians Association of Australia. The key elements of the framework are scope of

practice; educational standards; competency standards, practical placements and assessment to practice (entry to practice); accreditation standards; quality assurance/continuing competency requirements and the cultural context in the country under consideration. Each of these elements requires review of documentation and consideration of key criteria to determine similarities, differences and equivalency. Negotiation of mutual recognition between countries requires reflection on the core elements of dietetic education, practice and evaluation and this in itself has proved a valuable exercise. We envisage clear application of an assessment framework will ensure recognition between countries will only occur when the arrangement is mutually beneficial.

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3.2 Food Service
LEAD SESSION: IMPROVING OPPORTUNITIES FOR FOOD SERVICE AND DIETETICS PRACTICE IN HOSPITALS AND RESIDENTIAL AGED CARE FACILITIES

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Food is a phenomenon that everyone has an opinion on because eating is a frequent, often social occurrence, and as such the importance of mealtimes can be undervalued in health care settings. Some staff may not share our concerns about suboptimal dietary intakes as they assume that nutritional status will improve as people feel better. However the provision and consumption of an appealing and adequate diet is a critical aspect of holistic health care. Labelling food service departments as a 'hotel service' or a 'non-clinical service' does little to assist the perception of these services by others; to enhance the knowledge and skills needed by others about optimising dietary intake opportunities by the sick and elderly; or to enhance the communication that is needed between stakeholders about food and mealtimes. Malnutrition in hospitals and residential aged care is a serious concern, with prevalence rates of approximately 7–53% in acute wards, 6–49% in rehabilitation settings and 50% in residential aged care. The issue of addressing malnutrition, reviewing and improving menus, mealtime environments, feeding assistance, communication between staff and acknowledgement of the important care role of food service providers becomes even more relevant as the population ages and the demand for health care grows. This narrative highlights that the importance of dietitians building links with food services, leading high quality research and improving the profile and recognition of food and mealtimes as integral to care has never been greater.

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600. FOOD POLICY, DIETARY INTAKES AND CHRONIC DISEASE IN PRISONS

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International research on prisoners demonstrates poor health outcomes, including chronic disease, with the overall burden to the community high. Prisoners are predominantly male and young. In Australia, the average incarceration length is 3 years, sufficient to impact long term health, including nutrition. Food in prisons is highly controlled, yet gaps exist in policy. In most Western countries prisons promote healthy foods, often incongruent with prisoner expectations or wants. Few studies have been conducted on dietary intakes during incarceration in relation to food policy. In this study detailed diet histories were collected on 120/945 men (mean age = 32 years), in a high-secure prison. Intakes were verified via individual purchase records, mealtime observations, and audits of food preparation, purchasing and holdings. Physical measurements (including fasting bloods) were taken and medical records reviewed. Results showed the standard food provided consistent with current dietary guidelines, however limited in menu choice. Diet histories revealed self-funded foods contributing 1–63% of energy (mean = 30%), 0–83% sugar (mean = 38%), 1–77% saturated fats (mean = 31%) and 1–59% sodium (mean = 23%). High levels of modification to food provided was found using minimal cooking amenities and inclusion of self-funded foods and/or foods retained from previous meals. Medical records and physical measurements confirmed markers of chronic disease. This study highlights the need to establish clear guidelines on all food available in prisons if chronic disease risk reduction is a goal. This study has also supported evidenced based food and nutrition policy including menu choice, food quality, quantity and safety as well as type and access to self-funded foods.

Funding source: Research higher degree student allowance

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218. THE EFFECTIVENESS AND POPULARITY OF A TRAFFIC LIGHT LABELLED MENU HIGHLIGHTING HEALTHY CHOICES ON THE HOSPITAL MENU IN A MATERNITY UNIT

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Nutritional labelling of menus has been used to help consumers select healthier foods in a number of settings (Pulos & Leng, 2010). The UK Food Standards Agency (FSA) multiple traffic light system is widely used on processed foods to provide information on levels of key nutrients and has potential to be extended to food offered in a variety of food service settings. This study explored the effectiveness and popularity of this system on a hospital menu in the maternity unit of a major teaching hospital in Bristol, UK. All meals on the menu were nutritionally analysed and colour coded using FSA criteria to highlight red (high), amber (medium) or green (low) levels for fat, saturated fat, sugar and salt. The profile of 200 meals chosen before the introduction of the traffic light labelled menu and 200 afterwards were examined. There was no statistically significant difference between meals chosen before and after the introduction of the new menu but there was a trend for increased consumption of foods labelled with green traffic lights post labelling. A questionnaire was distributed to assess patient views of the system. 72% of the respondents who used the labelled menu felt it helped them make choices and 52% felt it would help improve their overall diet. Multiple traffic light labelled menus are popular and perceived as useful by patients in a hospital setting. They may lead to improved choices but follow up studies with larger sample sizes in multiple settings are necessary.

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134. INDIGENOUS AUSTRALIAN WORKPLACE CATERING GUIDELINES

DEBBIE CHEN, CAITLIN MCGARRY, **JESSICA TZVETKOFF**
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Nutrition promotion in the workplace has been recognised as an important parameter to increase employees' productivity, reduce their number of sick days per year and improve the overall health of

employees. The Catering Guidelines were developed for the Queensland Aboriginal and Islander Health Council (QAIHC) and its member services to help improve the provision of and access to healthy food at catered work functions and meetings. A community development approach was implemented, whereby communication and consultation with stakeholders was paramount. Findings suggest a high proportion of staff will support the guidelines once implemented, therefore it can be assumed that a reduction in unhealthy food ordered and provided through workplace catering will be well received. The Catering guidelines have been designed so that each service can adapt the QAIHC guidelines to suit their own needs. Evaluation processes have been incorporated into the plan with a 12 month post implementation survey developed to report on outcomes. They are currently being introduced to services and we will present the guidelines and the story so far in the implementation within our member services.

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3.3 Dietary Patterns and Behaviours 1
LEAD SESSION: RESEARCH INSIGHTS INTO DIETARY PATTERNS AND DIETARY BEHAVIOURS IN PUBLIC HEALTH

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Dietary patterns, diet quality and diet-related behaviours have increasingly become the focus of research in public health nutrition. While each of these constructs may measure different aspects of diet, from a public health perspective, a greater understanding of these can assist in the development and application of food-based dietary guidelines, public health interventions and policies. Total dietary patterns reflect multiple aspects or dimensions of diet simultaneously and have the potential to capture interactions that may occur between a variety of food components and constituents while diet quality measures usually attempt to assess compliance with established dietary guidelines. Diet-related behaviours are often useful indicators of overall dietary patterns or diet quality. Depending on the approach taken, assessment of dietary patterns can result in a behavioural description of food intakes. They provide useful insight into the eating patterns evident within the population and can identify at-risk groups or patterns of behaviour. Measures of dietary patterns can be used in epidemiological studies either to investigate associations of with particular health outcomes or as a confounder when investigating other exposure-disease relationships. In behavioural research, they may be used to investigate interactions with other health behaviours or may be used to examine the determinants of healthy eating patterns. Dietary indices, may be used in monitoring and surveillance to assess how well people comply with dietary guidelines, to monitor trends in the population over time, and to target diet and nutrition messages for the public. Measures of diet-related behaviours may be appropriate targets for interventions or used to evaluate health promotion intervention. Examples of each of these applications from the literature will be provided.

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286. THE NUTRITION AWARENESS, ATTITUDES AND BEHAVIOURS OF PACIFIC ISLANDER ATHLETES IN AUSTRALIA

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Athletes from Pacific Islander backgrounds are an emerging practice consideration for Australian sports dietitians. Culturally appropriate health and nutrition interventions have been successfully implemented in Pacific Island populations. However, specific cultural adaptation required for sports nutrition education in this population has yet to be investigated. The purpose of this study was to reveal cultural considerations for delivering sports nutrition advice to Pacific Islander athletes in Australia. This study used the qualitative method of semi-structured interviews conducted with 15 athletes of Pacific Islander nationality currently residing in Australia. Participants were asked about their nutrition awareness relevant to sports performance; sources of nutrition information; shopping, food preparation and eating behaviours; and social and environmental factors that influence food choice. Results indicated family, religion, coaches and others athletes to be the most influential social factors for Pacific Islander athletes. Pacific Islander food behaviours such as social feasting and the use of fats and oils in cooking were identified as important environmental influences. A strong desire for education without a preference of learning method was reported. Health professionals delivering sports nutrition services to Pacific Islander athletes should prioritise assessing the impact of their clients support network on eating behaviour. Further research is needed to determine specific priority topics for sports nutrition education and to assess the effectiveness of culturally adapted nutrition information for sports performance.

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241. MATERNAL FEEDING KNOWLEDGE AND USE OF REWARDS IN FEEDING MEDIATED IMPROVED CHILD DIETARY QUALITY FOLLOWING THE MELBOURNE INFANT PROGRAM RCT

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Children's diets have an important impact on their health outcomes, but are often suboptimal. Given that mothers are a critical influence on children' diets, this research aimed to test maternal knowledge and feeding practices as mediators of an intervention to improve children's diet quality. The Melbourne Infant Feeding, Activity and Nutrition Trial (InFANT) Program was a novel health-promotion randomised controlled trial (RCT). The anticipatory-guidance intervention included six education sessions for first-time parents over 15 months, aimed at improving child dietary intakes and maternal feeding knowledge and practices. At intervention conclusion, child diet was assessed using three 24-hour recalls and a purpose-designed diet quality index reflecting intakes of fruits, vegetables and non-core foods and beverages. Maternal feeding knowledge was assessed using a 12-item purpose-designed tool and feeding practices were assessed using the Comprehensive Feeding Practices Questionnaire (Musher-Eizenman, 2007). At baseline, 542 families were recruited. Post-intervention, when children were 18 months old, 375 participants provided complete follow-up data. Post-intervention child diet quality score was significantly higher for children in the intervention arm compared to control arm (scores 15.6 and 14.5 out of 30 respectively,

p = 0.014). Mediation analysis showed that increased maternal feeding knowledge and reduced use of rewards in child feeding for intervention participants mediated the direct intervention effect on child diet quality. In conclusion, this novel, low-dose intervention achieved improved child diet quality via improving maternal feeding knowledge and reducing use of foods as rewards. This evidence of intervention efficacy and mediation provides important insights for future interventions.

Funding source: Australian National Health and Medical Research Council (NHMRC) Project Grant (425801), and contributions from the Heart Foundation of Victoria

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617. WEIGHT LOSS AND MAINTENANCE USING VIRTUAL REALITY (SECOND LIFE®)

DEBRA K SULLIVAN[1], JEANNINE R GOETZ[1], CHERYL A GIBSON[1], JASON LEE[2], STEPHANIE GERALD[1], TENNILLE FINCHAM[1], DAVID ANTONACCI[1], JOSEPH DONNELLY[1,2]
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Traditional weight management clinics present barriers for participants (i.e., cost, transportation, location, etc.) and service providers (i.e., space, inventory, overhead, etc.). Therefore, we evaluated the potential of a web-based virtual reality platform, Second Life® (SL), where individuals are represented as avatars as an alternative weight management delivery system. Twenty participants (17 females and 3 males; 32.8 ± 5.1 BMI; 31.1 ± 3.6 years) were randomized to weight loss (3-month) with a traditional in-person clinic (T) and weight maintenance (6-month) using SL (T/SL) or SL for both weight loss and maintenance (SL/SL). Weight loss and maintenance was achieved via a reduced energy diet and physical activity (PA). Each group received the same 60 minute, behaviourally-based weight loss and maintenance clinic weekly, either delivered by an in-person or virtual reality clinic conducted in SL. Self-report of diet intake and PA was obtained weekly. Weight loss at 3 months was not different (T/SL = 10.0 ± 4.29 kg. vs. SL/SL = 9 ± 4.8 kg). During 6 months maintenance period, the T/SL group regained 13.6% of their weight loss, while the SL/SL group lost an additional 3.7% ($p < 0.01$). There was no difference in energy or nutrient intake. The SL group reported significantly greater intake of fruit servings (2.9 vs 1.9 svgs/day, $p < 0.03$) and steps of PA (82,124 vs. 59,903 steps/week, $p < 0.04$) with a trend for vegetable intake (2.5 vs. 1.8 svgs/day, $p = 0.07$). The pilot study results suggest that virtual reality platforms can be an effective alternative to traditional clinics and may offer advantages for weight maintenance.

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643. THE MELBOURNE INFANT PROGRAM POSITIVELY IMPACTS VERY YOUNG CHILDREN'S LIFESTYLE PATTERNS

KAREN CAMPBELL, SARAH MCNAUGHTON, **SANDRINE LIORET**, DAVID CRAWFORD, KYLIE BALL, KYLIE HESKETH
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This paper describes young children's diet and lifestyle patterns at the conclusion of a parent-focused obesity prevention intervention delivered when infants were 3 to 18 months of age. The Melbourne (InFANT) Program is an on-going cluster RCT involving 542 first-time mothers and children. The program focused on providing mothers with knowledge and skills to support development of positive diet and physical activity behaviours and reduced sedentariness in infants. The effect of the intervention was assessed for the following outcomes in children: television viewing time, physical activity, intakes of fruits, vegetables, non-core drinks, water, sweet, savoury snacks and zBMI. Outcomes were analysed both independently and synthesised in lifestyle patterns (principal component analysis). At intervention conclusion, compared to control children, intervention children had lower intakes of sweet snacks (OR 0.60, 95% CI 0.39; 0.92) and viewed less television (OR 0.67, 0.40; 1.10). There was less evidence for differences with respect to consumption of fruit, vegetables and water and little evidence for differences on zBMI and physical activity. Two lifestyle patterns were identified, namely "Fruits and water," and "Television and non-core snacks." Scores of the latter pattern were significantly lower in the intervention children at post-intervention ($p = 0.02$). This low dose intervention holds promise as a means of influencing behavioural determinants of overweight in infancy.

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3.4 Food Innovation

LEAD SESSION: *THE TITLE FOR THIS SESSION WAS NOT PROVIDED BEFORE PUBLICATION*

GUN-HEE KIM

Abstract not received for publication

507. EFFECT OF A DIET WITH FLAXSEED-OIL FOR IMPROVEMENT OF METABOLIC SYNDROME AMONG SPECIFIC HEALTH CHECKUP PATIENTS

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The aim of this study was to assess the effect of a diet with flaxseed-oil for improvement of metabolic syndrome. The intervention was conducted from November 2009 to March 2010. For each groups, we conducted baseline survey (clinical examination and dietary survey) in October 2009 and the same survey was performed at two, four months after intervention. The period of taking flaxseed-oil was two months from November 2009 to January 2010. Subjects were assigned to the Practice Program Group as intervention group (IG: 4 males and 5 females, average 46.8 years) and received eight times sessions (lecture and cooking); e-mail Program Group as control group (CG: 9 males, average 48.8 years) received two times sessions, and information of four times by e-mail. Ethics committee approval No. 09-08. IG showed significant decreases in BMI ($p < 0.05$), SBP ($p < 0.05$), DBP ($p < 0.01$) compared with CG after two months, and in BMI ($p < 0.05$), SBP ($p < 0.05$), DBP ($p < 0.01$), LDL-C ($p < 0.05$), HbA1c ($p < 0.05$) after four months. IG showed significant decreases in MetS risk-factors after two and four months ($p < 0.01$, $p < 0.05$) compared with CG. IG showed significant decreases in dinner energy intake ($p < 0.01$), total energy intake ($p < 0.05$) compared with CG, and increase in soybeans energy intake ($p < 0.05$) after two months. IG showed significant decrease in total energy intake ($p < 0.05$) compared with CG, and increase in vegetable energy intake ($p < 0.05$) after four months. IG showed significant decreases in plasma stearic acid ($p < 0.01$), linoleic acid ($p < 0.05$) compared with CG after two months, and increases docosahexaenoic acid ($p < 0.05$), arachidonic acid ($p < 0.05$) after four months. This study showed the effect of a diet with flaxseed-oil for improvement of metabolic syndrome.

168. EFFECT OF 6 WEEKS CONSUMPTION OF B-GLUCAN RICH OAT PRODUCTS ON CHOLESTEROL LEVELS IN MILDLY HYPERCHOLESTEROLAEMIC OVERWEIGHT ADULTS

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Several regulatory bodies have approved a health claim on the cholesterol-lowering effect of oat β-glucan at levels of 3.0 g/day. This study aimed to test whether 1.5 g/day β-glucan provided as ready-to-eat (RTE) oat flakes was as effective in lowering cholesterol as 3.0 g/day from oats porridge. A 6-week randomised controlled trial was conducted in 87 mildly hypercholesterolaemic (≥5 mmol/l and <7.5 mmol/l) men and women assigned to one of three diet arms (25% E protein; 45% E CHO; 30% E fat, at energy requirements for weight maintenance): (1) Minimal β-glucan (Control – C); (2) Low dose oat β-glucan (1.5 g β-glucan; Oats Low – OL) or (3) Higher dose oat β-glucan (3.0 g β-glucan; Oats High – OH). Changes in total and LDL-cholesterol (LDL-C) from baseline were assessed using a linear mixed model and repeated measures ANOVA, adjusted for weight change. Total cholesterol reduced significantly in all groups (−7.8 (SD = 13.8)%, −7.2 (12.4)% and −5.5 (9.3)% in OH, OL and C groups), as did LDL-C (−8.4 (18.5)%, −8.5 (18.5)% and −5.5 (12.4)% in OH, OL and C groups) but between-group differences were not significant. In responders only (n = 60), β-glucan groups had higher reductions in LDL-C (−18.3 (11.1)% and −18.1 (9.2)% in OH and OL groups) compared to controls (−11.7 (7.9)%; P = 0.044). Intakes of oat β-glucan were as effective at doses of 1.5 g/day compared to 3 g/day when provided in different food formats that delivered similar amounts of soluble β-glucan.

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163. EFFECT OF *VIGNA SINENSIS* ON INCREASED PRODUCTION OF BREAST MILK

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Deficiency of the production of breast milk can occur during lactation. In Central Kalimantan, Indonesia, 30% lactating women complained about insufficient milk production. This research aimed to contribute to the availability of breast milk in sufficient amount to help mothers successful in breastfeeding their babies exclusively by making use of *Vigna sinensis* to increase the production of breast milk. This study was quasi-experiment, conducted on 2011 with an intervention of administration of *Vigna Sinensis* compared to control group. Follow up was carried out to assess the breast milk production. This study location was in Central Kalimantan Province. The samples were as many as 134 persons meeting inclusion criteria, which were breastfeeding mothers, at term delivery with birth weight of ≥2500 gram, mothers' age 20–35 years, babies' age <6 months and the babies having not received any additional food in addition to breastfeeding. The exclusive criteria were either mothers or babies who were sick, mothers who consumed alcohol and mothers who smoked. Data analysis use univariable, bivariable and multivariable. The result showed that after treatment, there was an increased production of breast milk in the intervention group as much as 262.96 ml while in the control group 126.46 ml. *Vigna Sinensis* could increase the production of breast milk 107.93% higher than the control group with $\rho = 0.0000$ ($\rho < 0.05$). This research concludes that mothers who consumed *Vigna Sinensis* had higher production of breast milk than those who did not.

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184. 'SPF' ON YOUR PLATE: THE NEW NUTRITIONAL PARADIGM OF COMPLEMENTARY SUN-PROTECTION

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Skin cancer rates are epidemically climbing despite increasing awareness and external precautions, i.e. sun-screen/avoidance, warranting exploration of complementary strategies. The sun's damaging effect, including skin-penetrating ultraviolet-A radiation, involves photo-oxidation mechanisms that consume skin and plasma antioxidants. Dietary antioxidants – i.e. carotenoids, vitamins C and E, selenium, flavonoids, and polyphenols – have been shown to counteract sun damage, by reducing DNA fragmentation, inflammatory response, and immune suppression. The Greek-Mediterranean diet contains many sun-protective components, being high in antioxidants (fruits/vegetables, spices, red wine, olive oil) and anti-inflammatory n-3 polyunsaturated fatty acids (PUFA), and low in pro-inflammatory n-6-PUFA and pro-oxidants (red meat). Greece also has among the world's lowest melanoma incidence/100,000 (2.14 males, 2.99 females [2000]) vs. European average (6.32, 7.29 [2000]) and Israeli rates (17.06, 14.82 [2000]), with European-origin Israelis (33.6, 24.0 [2003–2004]) second only to Australians (39.80, 31.80 [2000]). Though skin pigmentation is a major factor, the question of protective potential of diet was raised. Women exposed to sun radiation (Baltic beach 4–6 h/day for 14 days) consuming water/cola (750 ml/day, n = 16) showed a gradual increase in blood plasma malondialdehyde levels 55.5% (8.36 to 13.0 μmol/L, $p \leq 0.02$), vs. antioxidant-fortified fruit juice (750 ml/day, n = 21) a 15.8% decrease (8.52 to 7.175 μmol/L), with aggregate between-group difference ~60%. Tomato paste (~16 mg/day lycopene, 10 weeks) was associated with 40% reduced ultraviolet-induced erythema. The above and extensive research suggests the Mediterranean diet may represent a gold standard for sun-protection. Complementary sun-protection by diet and relevant components for high-illumination geographical regions with special regard to immigrants, skin-type, and age-related sensitivity will be discussed.

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3.5 ***Hot Topics****

The abstracts for this session were not decided before publication

3.6 Community Based Interventions

550. WHAT WORKS FOR COMMUNITY-BASED NUTRITION PROGRAMMING? DEVELOPMENT OF TECHNICAL SUPPORTIVE SUPERVISION IN OROMIA REGION, ETHIOPIA

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The Community Based Nutrition Approach (COBANA) Project in the Oromia Region, Ethiopia began activities in September 2008 for a period of five years. The Project aims to improve the nutrition status of children under five years old and pregnant and lactating women by strengthening community health services in three targeted zones and ten woredas in the region. As supportive supervision and mentoring community workers and supervision of the mother support groups are crucial to the success of community nutrition programs, the Project has conducted Technical Supportive Supervision (TSS) training for more than 550 related persons including health providers from the health facilities linked to the programme and implemented

a package of TSS with tools (such as a supervision checklist) and resources (such as transportation funds). A study; including quantitative data collection and analysis and qualitative assessment such as focus group discussion, was developed in order to examine current situation of TSS implementation and clarify relevant issues in order to define the necessary action point for strengthening TSS in December, 2010. The presentation will share methods for the programme implementation and some of findings from the survey to explore the role of community programming in strengthening health system, and to discuss integration of nutrition into other community-based health and other sector programs.

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598. DIFFERENCES BETWEEN PARENT AND PRACTITIONER PERCEPTIONS OF LIFESTYLE FACTORS IN YOUNG CHILDREN

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There is a disconnect between the current community prevalence of childhood overweight, parent's perceptions of their child's weight and early childhood practitioners' concerns (Campbell, 2006). This study surveyed 796 parents of children 0–8 years and 45 early childhood practitioners in two local government areas of high socio-economic disadvantage in Victoria. Parents of children attending early childhood services (n = 423) were surveyed about their child's nutrition and physical activity practices, concerns, sources of advice and unmet needs. Despite the national prevalence of overweight and obesity among 2–3 year olds (21%) and 4–6 year olds (18%), only 5% of parents expressed concern about excess weight in their child. However, 32% of early childhood practitioners (childcare workers, preschool teachers and early childhood nurses) reported the need to discuss weight issues with parents. Parents and practitioners differed in their perceptions of lifestyle indicators including children's consumption of sweet drinks, levels of physical activity and screen viewing. Some reported parental perceptions were associated with CALD family background and absence of maternal post-secondary education. Results around perceptions of child weight are consistent with other studies. The observed lack of common understanding between parents and practitioners limits opportunities for discussion and intervention.

Funding source: Prevention and Population Health Branch, Department of Health, Victoria

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435. FOOD LITERACY IN THE NEW NUTRITION SCIENCE

HELEN VIDGEN, DANIELLE GALLEGOS
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The International Union of Nutrition Science's Giessen Declaration calls for a new nutrition science that extends beyond a 'biological science' to include a comprehensive understanding of 'how food is grown, processed, distributed, sold, prepared, cooked and consumed'. 'Food literacy' is an emerging term used to describe this. However, despite their being a strong call for action from practitioners, government, researchers and the public, there is significant ambiguity around what this actually means and its relationship to nutrition. A Delphi study of 43 Australian food experts from diverse sectors and settings explored what food literacy is, what its components are and how it relates to nutrition. The three round Delphi began with a semi-structured telephone interview and was followed by two online surveys. Grounded theory was used to develop a conceptual model of the relationship between food literacy and nutrition. The model was then tested and refined following a phenomenological study of consumers using the example of young people leaving home for the first time. It is proposed that food literacy influences nutrition through three related mechanisms of security, choice and pleasure. These mechanisms will be mediated by the local food supply and individual values. The relative importance of components of food literacy will depend upon these mediators. The level of nutrition outcome being sought (e.g. dietary guidelines vs food group serves) will also influence the relative importance of these components. This model is useful in guiding investment and practice.

Funding source: Health Promotion Queensland, Queensland Health

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596. MULTIPLE NUTRITION AND PHYSICAL ACTIVITY DISADVANTAGE FOR FAMILIES WITH YOUNG CHILDREN ATTENDING SUPPORTED PLAYGROUPS

JUDITH MYERS[1], KAY GIBBONS[1,2], NATASHA HAMPSON[1], GERALDINE NAUGHTON[2], EVELYN VOLDERS[1]
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Nutrition and physical activity in early childhood have short and long-term consequences for child health and development. Poorer nutritional practices and health outcomes are associated with socio-economic disadvantage (Wilkinson & Marmot, 2003). The influence of families living in disadvantaged circumstances on early childhood nutrition and physical activity is under researched, but outcomes may be positively influenced by the family environment (Kelly, 2011). The aim of this study was to compare the nutrition and physical activity practices, needs and concerns of families with young children attending supported playgroups with children attending mainstream early childhood services (n = 412). Children aged 0–4 years and their parents/carers attending supported playgroups in two Victorian municipalities were surveyed about nutrition and physical activity practices, health and nutrition concerns and access to information, services and resources. Poorer nutrition practices such as higher consumption of 'packaged foods' and 'sweet drinks' were associated with children attending supported playgroup ($p = 0.012$, $p = 0.005$, respectively). Conversely, fewer families of children attending mainstream services reported experiencing food insecurity ($p = 0.016$) than supported playgroup families. In context with poorer nutrition practices, the playgroup families identified more difficulty accessing ($p = 0.001$), and understanding ($p = 0.002$) nutrition and physical activity information and advice. Greater difficulties were observed in playgroup families from culturally and linguistically diverse (CALD) backgrounds ($p < 0.001$), mothers born overseas ($p < 0.001$) and mothers without post-secondary education ($p = 0.012$). More specific nutrition and physical activity strategies to support families with high needs or from CALD backgrounds are required.

Funding source: Prevention and Population Health Branch, Department of Health, Victoria

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717. DEVELOPMENT AND EVALUATION OF A DESK CALENDAR FOR NUTRITION PROMOTION: A PUBLIC-PRIVATE PARTNERSHIP

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Food and Nutrition Research Institute, Philippines

The Food and Nutrition Research Institute of the Department of Science and Technology and Robinsons Supermarket Corporation embarked on developing and producing a desk calendar for 2011 containing information on local vegetables. The calendar was distributed among regular customers of the Supermarket all over the Philippines. A reader feedback survey was done in selected branches to determine the profile of recipients and attributes given to the desk calendar. Sixty-four respondents participated in the survey. Majority (82.8%) of the respondents were 21–50 years old and females (85.9%). Main areas of work include business and finance, medicine, education and food service. More than half (53%) said other family members use the calendar while others reported friends and officemates use it too. The calendar was reported as used for reminding on important dates (15.6%), scheduling (9.4%), recipes (7.8%), nutrition guide (6.3%), decoration (6.3%), and for information (6.3%). The respondents thought that the desk calendar's contents are relevant (31.3%) to very relevant (59.4%), with just enough information (78%) and used simple (40.6%) to appropriate language (54.7%). In general, the calendar had a satisfactory (39.0%) to very satisfactory (40.6%) acceptability rating. The results showed that the desk calendar may be an effective material in promoting nutrition among the general public. The survey recommends optimizing public-private partnerships to maximize reach of food and nutrition information to the people.

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608. INNOVATION IN THE NEW ZEALAND COMMUNITY

ALISON PASK, LOUISE BECKINGSALE
Well Health PHO, New Zealand

The New Zealand government has a policy of "Better, sooner, more convenient." This paper will show how dietitians have shown innovation and effectiveness for the 21st century.

In November 2009 two newly created community dietitian roles were funded in two high needs areas of Wellington, New Zealand's capital city. The aim of these positions was to reach high needs ethnic groups, particularly Maori and Pacific communities not accessing traditional hospital based dietetic services. The service was set up to provide closer links with primary care including individual appointments and group workshops for those with poorly controlled diabetes and at high risk of cardiovascular disease. Innovative community approaches have ensured optimal participation by members of local communities. Creative initiatives include a community leaders programme, where leaders have attended interactive practical nutrition workshops and returned to the community to role model and promote healthy eating messages within their own communities such as churches, city council, community groups and youth programmes. A Marae based hangi programme has attracted Maori men who wouldn't normally attend a dietitian clinic in a traditional health setting. Evaluation of this unique dietetic service has exceeded expectations. Due to the restricted health budget available in the near future, this service is working towards concentrating efforts on initiatives which achieve the best outcomes with limited resources.

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The remaining abstract for this session was not decided before publication

3.7 Research Designs and Methods 1

531. MEASURING LOCAL FOOD ENVIRONMENTS: AN OVERVIEW OF AVAILABLE METHODS AND MEASURES

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University of Wollongong, Australia

Reliable and valid measures of local food environments are needed to more fully understand the relationship between these environments and health and to identify potential intervention points to improve access to, and the availability of, healthy foods. These measures also inform policy making, including the zoning of food outlets and food labelling or information requirements. A literature review was undertaken using health, behavioural and social sciences, nutrition and public health databases, and grey literature, to identify and appraise the range of data collection methods and measurement instruments and indices available for assessing local food environments in different locations across the globe. Included articles were those measuring aspects of food environments published between 2000 and 2010. A range of tools and methods are available to measure different components of food environments. Five methods/tools for describing the 'community nutrition environment' were assessed, with these recording the number, type and location of food outlets. Eleven methods/tools for assessing the 'consumer nutrition environment' were included, with these incorporating factors such as the available food and beverage products, their price and quality, and any promotions or information to prompt consumers to make purchasing decisions. Understanding how such tools have been used and any identified limitations of their use, is an important basis on which to devise a systematic approach for use by practitioners when quantifying these environments.

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171. A NEW TOOL FOR DIETARY INTAKE ASSESSMENT – THE ISRAELI FOOD AND FOOD QUANTITIES GUIDE

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In the Israeli Mabat National Health and Nutrition Survey series, the 24 hour recall is used for dietary assessment. Difficulties arise when attempting to describe uncommon foods, cooked and homemade dishes, and when quantifying unpackaged foods and non-standard sizes. Inaccuracies increase where the interviewer is unfamiliar with reported foods, thereby omitting relevant questions (probes). To improve description and quantification, a new tool – the "Food and Food Quantities Guide" was developed, which combines numerous probes, hundreds of food photographs, serving dishes, and diagrammatic geometric shapes. Probes relate to food type, preparation, additions, with colour coding facilitating items location. For photograph preparation, attention was paid to technical aspects such as angle and display to avoid size distortion, cutlery use to aid comparability. Selection criteria for foods included quantification difficulty, amorphous nature, size variations, odd size. All food weights and dimensions are documented, aiding computerized data entry. The guide is fully indexed, and easily portable for field work. The initial Hebrew edition, and its adapted (probes, foods) Arabic version, was used in over 10 000 recalls and a second, improved edition recently produced. Quickly and cheaply prepared (digital photography, colour printing) versions have been used internationally. The Guide, with its probes and photographs, enables improved description and quantification of food intake, lessens interviewer burden, is easily adaptable to local heterogeneous cuisine and multi-lingual settings, can be rapidly and

economically prepared, and adapted for computer data entry and analysis. Additionally, it can function as a teaching tool, in clinical and community settings.

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250. ENERGY EXPENDITURE IN HEALTHY, COMMUNITY-DWELLING OLDER ADULTS; ARE PREDICTIVE EQUATIONS VALID?

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Prevalence of malnutrition is high in older adults, with potentially devastating consequences. In order to provide adequate nutrition to this frail group it is necessary to be able to accurately estimate resting energy expenditure (REE) using predictive equations. The aim of this study was to assess the agreement between four commonly used predictive equations and measured REE, determined by indirect calorimetry. REE was measured for 129 healthy community-dwelling volunteers (54% male; mean age 79 years). REE was estimated from the prediction equations of Schofield, Harris-Benedict, Mifflin-St Jeor and the World Health Organization (WHO) and sub-analysed by gender. There was a moderate significant correlation between measured and estimated REE for all equations and all participants (r = 0.651–0.692) and ♀ (r = 0.651–0.705) but this was weaker for ♂ (r = 0.371–0.389), and there was a significant difference between means for all analyses except Mifflin ♀ (P = 0.538). Bland Altman analysis indicated overestimation of REE by Schofield (♂ 892 kJ, ♀ 779 kJ, ♂ + ♀ 839 kJ), Harris-Benedict (♂ 688 kJ, ♀ 556 kJ, ♂ + ♀ 626 kJ), Mifflin-St Jeor (♂ 707 kJ, ♀ 48 kJ, ♂ + ♀ 400 kJ) and WHO (♂ 1013 kJ, ♀ 955 kJ, ♂ + ♀ 986 kJ) equations. Limits of agreement were wide in all cases. Results indicate that the Mifflin-St Jeor equation is the most accurate for estimation of REE in community dwelling older adults, and the WHO equation is the least accurate. In the context of high prevalence of malnutrition in this group it is vital that practitioners are aware of the overestimations of predictive equations for estimation of REE. The authors recommend development of appropriate predictive equations for use in older adults.

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589. COMPARISON OF STANDING HEIGHT, PATIENT ESTIMATED HEIGHT AND DEMI-SPAN ESTIMATED HEIGHT FOR BODY MASS INDEX CALCULATION IN PATIENTS ADMITTED TO A REHABILITATION HOSPITAL

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Accurate information on adult height is required to calculate Body Mass Index (BMI), determine ideal body weight, assist in identifying malnutrition risk and assess nutritional status. Standing height is not always possible to measure or accurate in rehabilitation patients due to changes in posture, spinal deformities, or inability to stand upright. Demi-span has been proposed as a method of estimating adult height. Standing height, patient estimated height and demi-span estimated height were compared in rehabilitation inpatients (n = 89). Age groups analysed were 36–64 (n = 54) and 65+ (n = 35) years with a mean age (SD) of 55 (7), and 72 (6) years, respectively. Within the 36–64 year age group, the mean (±SEM) demi-span estimated height was 2.9 ± 0.8 cm less than standing height (P = 0.001); and 4.7 ± 0.9 cm less than patient estimated height (P < 0.001). Within the 65+ year age group the mean demi-span estimated height and standing height were similar [1.8 ± 0.9 cm (P > 0.001)] and the mean demi-span estimated height was 2.9 ± 0.8 cm less than patient estimated height (P = 0.004). The method for assessing height significantly changed the mean BMI in both age groups analysed (ANOVA P < 0.001 for both). In the 36–64 and 65+ age groups, 30% (16/54) and 40% (14/35) of participants, respectively, had a lower BMI when using demi-span compared with standing height. This demonstrates the need for consideration of height measurement methodology when calculating BMI and the potential impact of BMI classification in relation to nutrition management.

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402. USE OF THE WAIST-HEIGHT RATIO TO PREDICT METABOLIC SYNDROME IN OBESE CHILDREN AND ADOLESCENTS

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The waist-height ratio is a new index used to identify individuals with greater central adiposity, who may be at higher risk of developing the metabolic syndrome. This study aims to demonstrate that the waist-height ratio (WHtR) can be used as a simple, non-invasive screening tool in clinical practice, to identify obese children with the metabolic syndrome. Data from 109 obese males and females (BMI Z-score ≥1.645), aged between 10.00–16.50 years, were used in analyses. Blood pressure, blood lipids, insulin, glucose, height, weight and waist circumference (WC) were collected and used to calculate WHtR, BMI, *Z*-scores for BMI, WC, weight and homeostatic model assessment for insulin resistance (HOMA-IR). Binary logistic regression was used to test which anthropometric measure was a significant predictor of the metabolic syndrome. Among males, WHtR and BMI *Z*-score were positively correlated with insulin, HOMA-IR and TG and negatively correlated with glucose (P < 0.05). Among females, WHtR, BMI *Z*-score and WC *Z*-score were positively correlated with insulin, HOMA-IR, and negatively correlated with HDL-C (P < 0.05). BMI *Z*-score was also significantly correlated with systolic and diastolic blood pressure *Z*-scores. Twenty percent of subjects had the metabolic syndrome. WHtR (P = 0.01), BMI Z-score (P = 0.02) and HOMA-IR (P = 0.03) were all significant predictors of the metabolic syndrome. Of the 3 predictors of the metabolic syndrome in children, the WHtR is the simplest to collect and calculate in the clinical setting, making it an ideal non-invasive screening tool to utilise in clinical practice to identify obese children at risk of the metabolic syndrome.

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The remaining abstracts for this session was not decided before publication

3.8 Food Effects on Health

176. EFFICACY OF IRON FORTIFIED RICE ON THE IRON STATUS OF REPRODUCTIVE VIETNAMESE WOMEN

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Rice as a stable food is consumed daily by almost of Vietnamese population, could be a food vehicle for fortification program. The study evaluated the efficacy of iron fortified rice-IFR in improving iron status of reproductive age women-RW. It was a randomized, double-masked study of 244 women, in two groups. A meal based on IFR (SunActive® FeP80) was served 6 days/week with 15 mg premix per 150 g rice-Iron fortified group-FG or 0.75 mg Fe/day and no added iron-Control group – CG. Iron absorption estimated as 5%. Concentrations of haemoglobin (Hb, g/l), serum ferritin (SF, mcg/l), transferrin receptor (rTfR, mg/l) were measured at baseline (T0), 3 months (T3) and 6 months (T6). After intervention, in FG, concentrations of Hb, SF were significant higher Hb0: 123.5 ± 10.8; Hb6: 125.9 ± 8.9 ($p = 0.009$); SF0: 32.0 ± 35.2; SF6: 43.7 ± 53.1 ($p < 0.001$); TfR were lower: 6.3 ± 2.2; 5.1 ± 1.6 ($p < 0.001$); prevalence of anaemia decreased from 30.3% to 17.6%; prevalence of iron deficiency from 40.7% to 24.4%. In CG, Hb0: 125.6 ± 13.8; Hb6: 126.2 ± 11.7 ($p = 0.7$); SF0: 36.2 ± 27.2; SF6: 38.7 ± 31.0 ($p = 0.1$); TfR0: 6.2 ± 3.7; TfR6: 5.3 ± 2.4 ($p < 0.001$); prevalence of anaemia changed from 29.5% to 27.1%; of iron deficiency was 21.3%. So, regular consumption of IFR during 6 months significantly reduced the prevalence of iron deficiency anaemia in RW. Fortified rice is a potential strategy for control of Iron deficiency anaemia in Vietnam.

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234. DIETARY ANTIOXIDANTS, FRUITS, AND VEGETABLES AND THE RISK OF ASTHENOZOOSPERMIA

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Human semen quality and male fertility have been decreasing during the past decades. Epidemiological studies indicate a link between environmental pollutants, lifestyle changes, and dietary habits and semen characteristics. High levels of semen reactive oxygen species (ROS) and other oxidant radicals have been implicated as a risk factor for male infertility. The present study examined the association between dietary antioxidants, fruits, and vegetables and the risk of asthenozoospermia in Iran. A case–control study was conducted from 2010 to 2011. A total of forty asthenozoospermic men (incident cases) and ninety-seven controls underwent face-to-face interviews. Dietary information was collected using a validated 168-item food frequency questionnaire (FFQ). Semen parameters were determined using microscopic evaluation according to WHO guideline. Multivariate logistic regression was used to estimate odds ratios (ORs) and 95% confidence intervals (CIs). Age, education, and average daily energy intake did not differ significantly between cases and controls. Comparing cases to population controls, dietary intake of vitamin C, selenium and beta-carotene were inversely associated with the risk of asthenozoospermia (3rd vs 1st tertile, OR 0.63, 95% CI 0.47–0.78; OR 0.53, 95% CI 0.37–0.88; OR 0.51, 95% CI 0.33–0.79, respectively). The inverse association was strongest for vitamin E (OR 0.39, 95% CI 0.14–0.61). The inverse trends for fruit and vegetable intake were statistically significant (OR 0.50, 95% CI 0.39–0.71; OR 0.47, 95% CI 0.37–0.77, respectively). The results of the present study suggested dietary antioxidants, fruits, and vegetables play a protective role in asthenozoospermia.

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130. THE EFFECT OF *BANANA ISOTONIC DRINKS* TO REHYDRATION STATUS THROUGH THE MECHANISM OF BODY HOMEOSTATIC WITH BLOOD PRESSURE AND HEART RATE STABILIZATION

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Banana Isotonic Drink (BID) has been developed. The osmolarity of BID was 269 mOsm. It reached the standard of isotonic drink osmolarity. Isotonic drink able to improved the mechanism of orthostatic which was correlated with hydration status. Banana isotonic drink would be very useful for people with orthostatic problem. This research was to determine the effects of BID to rehydration status through the mechanism of body homeostatic with blood pressure and heart rate stabilization. This research was an experimental study with cross-over design. Sixteen subjects were divided into two groups, one control group (plain water / PW) and one treatment group (Banana isotonic Drink / BID). This subject has passed screening of voluntary dehydration. Subjects undergoing the process of adaptation for two days then continued with the intervention products of 500 ml and run a *Shellong* test. Wash-out period between interventions was 7 days and each data collection conducted in the morning. Data analysis performed with ANOVA test to know the difference between the time of inspection and independent t-test to determine differences among the treatments. Consideration of significant differences is $p < 0.05$. Data presented by the average and standard deviation (mean ± standard deviation). The results showed that BID were significantly different from plain water (PW) in the balancing of systolic blood pressure and heart rate ($p < 0.05$). BID can reduce the cardiac work in maintaining the body volume through the stability of systolic blood pressure and heart rate compared with plain water.

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97. STUDY OF ODOURS FOR QOL THROUGH IMPROVED DIETARY HABITS

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In an already aged society, healthy olfaction is a necessary part in the process of creating a safe and fertile living environment for everyone, and of improving the quality of life. Given these circumstances, the objective of this study was to understand the age-related decline in olfactory function in people aged 50–59 years, 60–69 years, 70–79 years and 80–89 years, and identify the odours which are particularly difficult for people of these age groups to distinguish in order to draw attention to the issues that face people and to facilitate the improvement in the quality of life. The study included 17 females aged 50–59 years (54.4 ± 4.6), 113 females aged 60–69 years (64.3 ± 2.9), 76 females aged 70–79 years (73.5 ± 2.8) and 5 females aged 80–89 years (82.8 ± 2.9) in Yakumo Town, Hokkaido, Japan. Odours were tested using a "standard odours by odour stick identification" (Daiichi Yakuhin Sangyo, Japan) method of organoleptic testing. Correct answers for identification odours consisted of 8.7 ± 2.7 in subjects aged 50–59 years, 7.4 ± 2.8 in subjects aged 60–69 years, 6.2 ± 3.1 in subjects aged 70–79 years, and 6.0 ± 2.7 in subjects aged 80–89 years. The ability to identify domestic gas – an odour that may be considered closely linked to QOL – was lost from the 60–69 years to the 80–89 years age group. Although "gas" is not an odour that

people actively look for in everyday life, considering the dangers posed by gas leaks and explosion, efforts must be made so that people won't forget such an odour.

44. NEGATIVE CORRELATION BETWEEN BLACK TEA CONSUMPTION AND DIABETES PREVALENCE IN THE WORLD

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It is believed that black tea main properties include antioxidant action with potential anti-inflammatory, cardiovascular or anti-cancer effects. The objective of this study is to investigate potential relations between black tea consumption and key health indicators in, including diabetes. A systematic data mining approach was carried out on black tea consumption data and on five key health epidemiological indicators from the World Health Survey conducted by WHO: respiratory diseases, infectious diseases, cancer, cardiovascular diseases and diabetes. A "principal component analysis" was used to segment the database composed of 6 variables (black tea consumption and 5 health indicators) into 3 synthetic dimensions to study potential positive or negative correlations. Then a linear correlation model was tested on selected variables. The principal component analysis established a very high contribution of the black tea consumption parameter on the 3rd axis (81%). The correlation circle represented the vector "black tea" strictly opposite to the vector "diabetes prevalence," suggesting a negative statistical correlation. Then a linear correlation model confirmed a significant statistical relation between high black tea consumption and low diabetes prevalence. This innovative study establishes a linear statistical relation between high black tea consumption and low diabetes prevalence in the world. Even if the objective of this analysis was not to demonstrate any direct cause-to-effect relationship, these results are consistent with biological and physiological studies conducted on the potential effect of black tea on diabetes and obesity. Further epidemiological research is necessary to investigate the causality.

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378. A RANDOMIZED CONTROLLED TRIAL INVESTIGATING THE EFFECTS OF A LOW GLYCEMIC INDEX DIET ON PREGNANCY OUTCOMES IN GESTATIONAL DIABETES MELLITUS

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The prevalence of gestational diabetes mellitus (GDM) is rising. There is little evidence to demonstrate the effectiveness of one dietary therapy over another. We aimed to investigate the effect of a low glycemic index (GI) versus a conventional high fibre diet on pregnancy outcomes, neonatal anthropometry and maternal metabolic profile in GDM. Ninety-nine women (age: 26–42 years; mean ± SD pre-pregnancy BMI: 24 ± 5 kg/m^2) diagnosed with GDM at an average of 26.0 (SD 4.2) wks gestation were randomized to follow either a low GI (LGI, $n = 50$; target GI ≈ 50) or a high fibre, moderate GI diet (HF, $n = 49$; target GI ≈ 60). Dietary intake was assessed by 3 day food records. Pregnancy outcomes were collected from medical records. The LGI group achieved a modestly lower GI than the HF group (mean ± SEM: 47 ± 1 vs 53 ± 1; $p < 0.001$). At birth, there was no significant difference in birth weight (LGI 3.3 ± 0.1 vs HF 3.3 ± 0.1 kg, $p = 0.619$), birth weight centile (LGI 52.5 ± 4.3 vs HF 52.2 ± 4.0, $p = 0.969$), prevalence of macrosomia (LGI 2.1 vs HF 6.7%, $p = 0.157$), insulin treatment (LGI 53 vs HF 65%, $p = 0.251$) or adverse pregnancy outcomes. There was no significant difference in GDM-related adverse pregnancy outcomes between low GI diet and high fibre diet. This study was registered at anzctr.org.au as ACTRN12608000218392.

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315. EFFECT OF TWO DIETS WITH VARYING INSULIN DEMAND ON DAY-LONG PROFILES OF BLOOD GLUCOSE AND INSULIN

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A food insulin index (FII) based on testing iso-energetic portions of single foods has been shown to be useful in predicting insulin responses to breakfast meals. The utility of the FII has not been validated in predicting insulin profiles over the course of a whole day. We aimed to investigate the effect of two diets with high and low FIIs on day-long blood concentrations of glucose and insulin. Ten healthy subjects consumed a high and a low FII diet in a randomized, crossover design, consisting of three consecutive meals over an 8-h period. The two iso-energetic diets were matched for macronutrients, fibre and glycemic index and differed only in the predicted insulin demand (FII = 65 vs 30). Capillary blood was sampled every 30 minutes from 0830 until 1630 and the plasma was assayed for glucose and insulin. The low FII diet resulted in 53% lower mean insulin incremental area under the curve (AUC) than did the high FII diet (31.9 ± 4.1 vs 68.1 ± 11.4 nmol/L*minute, P = 0.003) over the course of 8 h despite no significant difference in glucose AUC (387 ± 70 vs 360 ± 88 mmol/L*minute, P = 0.73). The same pattern of insulin secretion was also found for single isolated meals within the two diets. This study provides the first clinical evidence of the physiologic validity of the concept of food insulin index as a measure of day-long glucose and insulin profiles in a whole-diet context in lean, young healthy subjects.

Funding source: Internal revenue, University of Sydney

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CONFERENCE DAY 2
THURSDAY 6 SEPTEMBER 2012

SESSION 5
PLENARY: THE HEALTH OF INDIGENOUS COMMUNITIES

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To provide a succinct overview of the historical food eating patterns of Māori, the indigenous population of New Zealand, utilising traditional and new food sources by examining the dietary practices of older Māori, and the significance of these practices for their health and wellbeing. A historical review of food sources before European contact provided pre-colonisation eating patterns of Māori. Full engagement of older Māori was sought in the design and implementation of a longitudinal study of ageing. A feasibility study including older Māori aged 75 to 79 years provided detail of traditional foods currently utilised in Northland and the Bay of Plenty. For the main study local Māori providers

conducted the research processes and the longitudinal cohort study "Life and Living to Advanced Age; a cohort study in New Zealand" (LILACS NZ) was implemented. Nutritional assessment included nutrition screening at baseline and detailed assessment using the 24 hour MPR method for each participant in a 12 month follow up. A wide range of foods were utilised prior to European contact. The feasibility study showed similar traditional food use in Northland and Bay of Plenty and that traditional foods were valued and frequently used by older Māori. Those able to access important traditional foods on a regular basis had a significantly better nutrition status. Participants who have less regard for the importance of traditional foods to practice their culture tended to be at higher nutrition risk. In the main study nutrition screening identified over half of older Māori to be at high nutrition risk. Most participants view traditional foods to be very important and are able to eat these on a regular basis. Baseline findings show that the impact of colonization resulted in displacement of traditional foods from the diets of older Māori and this was accompanied by higher nutrition risk. Food is an important cultural activity for Māori and Māori elders may need to be supported to increase their consumption of traditional foods. Further investigations will examine the dietary patterns and nutritional intake of older Māori in relation to health and wellbeing.

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PLENARY: TACKLING FOOD SECURITY ISSUES IN INDIGENOUS COMMUNITIES IN CANADA: THE MANITOBA EXPERIENCE

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Promotion of healthy living, and chronic disease prevention are predicated on the ability of individuals and communities to make healthy choices. Having access to nutritious affordable food is one of the conditions required to make such choices possible but one that is too often not available, especially to families in remote regions of Canada. Drawing on international literature and Canadian research and practice this paper reviews food security issues as they pertain to indigenous communities, particularly in northern Manitoba, and describes community and government approaches to tackling food insecurity. Extremely high rates of food insecurity in remote communities are related to unique geographic and economic barriers to access associated with high transport costs, limited choices, and high food retail prices in socio-economically deprived circumstances. These are rooted in an historical erosion of traditional practices leading to reliance on an expensive and unhealthy southern food supply. Community-based action combined with structural changes and a supportive policy environment hold out the prospect of changing the conditions of food access that underlie the ultimate success of healthy living and chronic disease prevention efforts.

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Morning Concurrent Sessions – Session 6

6.1 Scope of Practice 2

362. DEVELOPMENT OF A STRATEGIC PARTNERSHIP TO ADVANCE EXCELLENCE IN DIETETIC EDUCATION AND PRACTICE IN CANADA

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Dietetic education in Canada is the responsibility of three groups that have distinct, yet complimentary functions. Dietetic educators (academic and internship/practicum) develop and administer programs that prepare dietitians for practice; Dietitians of Canada is the national organization that accredits dietetic education programs; and the provincial dietetic regulatory bodies register dietitians for practice within their respective jurisdiction and maintain quality assurance programs for registrants. While there has been a history of collaboration in setting standards, changes in provincial regulatory responsibilities, including formalized labour mobility agreements between provinces, has created the need for a more structured approach to setting national entry-to-practice standards and co-ordinated action on other matters of national concern such as Recognition of Prior Learning (RPL), accreditation and workforce mapping. In late 2008, representatives from the 3 sector groups came together to form the Partnership for Dietetic Education and Practice (PDEP). In 2009, the Partnership's first project, the development of a set of Integrated Competencies (ICs), was initiated. Through the work of the ICs, governance, financing and communications systems were established and tested. This session will focus on the factors that led to the establishment of a successful partnership that that recognizes the intersecting yet distinct needs and mandates of stakeholder groups and has led to effective collaboration on important national workforce and education issues in Canada.

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731. CHALLENGES IN CURRENT TRAINING PRACTICES/PRIORITIES IN ENTRY-LEVEL FOOD SERVICE MANAGEMENT AND ADMINISTRATIVE TRAINING IN CANADA: AN OPPORTUNITY FOR NEW PRACTICE ROLES

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Similar to the United States, Canada has seen a reduction of foodservice management and administrative dietetic learning opportunities within the healthcare industry. In all areas, dietitians require management and administrative skills. This study seeks to identify current training practices and priorities in food service management and administrative training within Canadian Dietetic Training Programs. Also, to understand the factors that influence market entry for new trainees into this area of practice, a second evaluation among dietetic interns to determine attitudes, perceptions and beliefs regarding food service management/administrative skill development. This is a cross sectional mixed methods study design. A 20-item questionnaire, validated for face and content, is sent to Program Directors and preceptors of all postgraduate and integrated dietetic internships as well as combined Masters/Internship programs in Canada. Focus groups will be conducted at both an integrated program and post-degree programs with dietetic interns to develop the questionnaire themes. There are no studies examining the Canadian training practices in entry-level food administrative dietetics. Characterization of priorities from the perspective of program directors, preceptors and trainees will have significant implications to dietetic practice and highlight the importance of administrative and managerial skills for entry level practitioners.

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658. SCHOOLS AS PRACTICE SITES IN DIETETIC EDUCATION: A "WIN-WIN" MULTICENTER PARTNERSHIP TO REDUCE CHILDHOOD OBESITY

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Dietitians play a pivotal role in the prevention and treatment of paediatric obesity. The exponential growth in foundational knowledge and

competencies required in dietetics education, coupled with increasing student numbers and dwindling program resources, creates a challenge to find sites for students that will provide experiential learning in preparation for internships and entry-level dietetics. Despite the epidemic of childhood obesity in our schools, dietetic services are limited to implement adequate prevention/ intervention strategies. Further, the disparity in obesity rates in underserved, low socio-economic, predominantly black schools create a need for culturally sensitive approach to address obesity. Our collaborative model empowered schools who desperately needed help to lower their obesity rates (45% obese/overweight), and carve structured practice sites for undergraduate dietetic students (students) and dietetic interns (interns). Under guidance of a registered dietitian, students provide primary prevention through structured nutrition education, school gardens, mentoring; interns provide focused obesity intervention through diet clinics, as part of the In-Health school clinics. Students and interns gain valuable interdisciplinary experience in working with administrators, teachers, nurse practitioners, and paediatricians in real-life situations. Through the Healthy Lifestyle coalition, we partnered with three local community schools: elementary, middle and high school, grades 4–12. Located in one of the most poverty-stricken neighbourhoods (90–98%), with predominantly black attendance (79.1–83.6%), and high mobility rates (35.3–48.5%) these schools provided enhanced cultural awareness practice. Implementation of this model is now in its third year. Details of our model and longitudinal assessment results will be presented to address sustainability and outcome data.

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694. DIETITIANS INVOLVEMENT IN THE TREATMENT OF PEOPLE WITH DEVELOPMENTAL DISABILITIES

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Feeding difficulties in people with developmental disabilities are typically a result of the interaction of multiple factors, the management of which can be very challenging. Developmental disabilities span across a wide range of syndromes, physical and intellectual disabilities and involve both the paediatric and adult clientele. Some areas requiring extensive dietitian involvement include the Autism Spectrum disorder with typical fussy and restricted food and fluid intakes, dysphagia requiring texture modified diets, paraplegia with extensive carer involvement for feeding, phenylketonuria, schizophrenia, malnutrition associated diseases and many more. Effective intervention therapy often requires the dietitian to work hand in hand with an interdisciplinary team consisting of a speech pathologist, physiotherapist, occupational therapist, dentist and various medical specialists. The dietitian working in disability plays a major role in the interdisciplinary team approach in the context of achieving the client's optimal nutritional status and well-being. The dietitian develops strategies that include the implementation of an eating and drinking plan for each client to ensure that safe practice standards are maintained at all times for a person with nutritional and or swallowing difficulties. Providing an eating and drinking plan is a relative simple strategy to implement and it has the potential to improve the nutritional status and quality of life for people with developmental disabilities.

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777. SEEING DIABETES THROUGH THE CHINESE CULTURAL LENS – A QUALITATIVE RESEARCH STUDY

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Often it is assumed that a culturally appropriate diabetes education program is one that includes discussion of cultural food habits and is delivered in the community language. This qualitative ethnographic study aimed to explore if a program of this type effectively promotes self-management. Eight in-depth interviews were conducted with Chinese Australians with type 2 diabetes to explore their health beliefs and behaviours, and understand their 'lived experiences' in accessing the diabetes education service delivered to their community. Interview data was analysed using a thematic analysis approach. Results indicated that the Chinese community with diabetes is not only challenged by the linguistic barrier in service and information access, but also confronted with a different medical system and set of health perceptions that often conflict against their traditional beliefs. The complicated management strategies required to cope with diabetes left the Chinese people interviewed feeling stressed, frustrated and helpless. They displayed an active information seeking behaviour that reflected the lack of accessible and culturally appropriate information and support in managing their diabetes. To promote self-efficacy and confidence in diabetes self-management, an innovative diabetes education program with community development principles is required to better support this ethnic community in managing this chronic disease.

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847. USING STORIES TO UNDERSTAND THE COMPLEXITY OF PEOPLE'S FOOD CHOICES

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Nutrition and dietetics relies heavily on quantitative research to provide evidence for practice, given that it demonstrates population-level associations, correlations or causal links between dietary intake factors and health outcomes. Qualitative research, is increasingly being undertaken by Dietitians to understand people's social world, their food choices and eating behaviours, However much of this qualitative research uses content and thematic analytical methods which have limitations, because they potentially de-contextualise the data from time and place. This paper presents the application of another qualitative method, narrative analysis, in a project that explores the effect of different places of food procurement, being community gardens, community supported agriculture (CSA), farmers' markets and supermarkets, on social connections in the food system, appreciation of food and food citizenship. The paper highlights the way in which personal and group narratives best capture the context and complexity of people's individual food procurement decisions; the meaning-making of people's social connections in the food system; their understanding of appreciation of food; and the characteristics of food citizenship, situated within a broader social, cultural and political environment. Narrative enquiry methodology has the potential to advance the research practice of dietitians, because it provides knowledge that moves beyond the dimension of mere content to an understanding of the complex, time and context dependent decision-making processes that people experience when choosing and consuming food.

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867. DESIGN AND EVALUATION OF AN NCP/IDNT IMPLEMENTATION PACKAGE

JANE PORTER, AMANDA DEVINE, THERESE A O'SULLIVAN
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Many Australian dietitians plan to adopt the Nutrition Care Process (NCP) and International Dietetic and Nutrition Terminology (IDNT), however there is currently no evaluated package available for implementation. We aimed to develop, implement and evaluate an implementation package using a change management model within two Western Australian hospitals and compare outcomes to a control hospital also in Western Australia. An 8-stage change management model implementation package was developed based on consultation with experts, perceived needs of Western Australian dietitians and feedback from dietitians in Queensland who had already undergone implementation, by anonymous survey. The package consisted of a guidance manual, presentations, case studies and resources. The package also included set up of site implementation champions and weekly contact by the researchers. The package was evaluated after a 5-month period. Compared to before the implementation dietitians using the package showed increased knowledge ($p = 0.006$); familiarity ($p = 0.014$); confidence to implement ($p = 0.026$), identify nutrition diagnoses ($p = 0.034$) and write problem, etiology, signs/symptom (PES) statements ($p = 0.034$). Package users reported increased access to NCP/IDNT mentors ($p = 0.011$); had sufficient training to feel knowledgeable ($p = 0.025$) and to implement NCP/IDNT ($p = 0.006$); and felt that less further training was required ($p = 0.017$). No significant changes were observed in the control group in these areas. Focus group results indicated that the package would be recommended for future use. Our results suggest that use of a specialised implementation package assisted dietetic departments to implement NCP/IDNT successfully.

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6.2 Indigenous Health (Australia)
LEAD SESSION: INDIGENOUS HEALTH AND EDUCATION (AUSTRALIA)

PAUL CHANDLER
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It is well established in the research literature that Indigenous Australians have significantly lower life expectancy than non Indigenous Australians. It is less well known that across many health and education measures Indigenous Australians are the most disadvantaged group living in any developed nation in the world. Recent research indicates that many of the disadvantages for Indigenous people are established well prior to school age. This presentation will discuss the Early Start Project at UOW and how it proposes to systematically address Indigenous health and education during the early years of life.

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567. NUTRITION ON INDIGENOUS RADIO: A PILOT STUDY

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Indigenous Radio Services contribute to the social and economic development and wellbeing of Indigenous people and can be a valuable tool for culturally-targeted health promotion opportunities. This project aimed to pilot a weekly, culturally-targeted, healthy eating and nutrition radio program on local Koori community radio (3KND) over a six month period. 'Angry Ant's Breakfast Show' hosted the dietitian for the nutrition segment every Monday from 8.15 to 9 am. Each week, a different topic was discussed, such as 'milk', 'soft drinks' and 'seasonal fruits'. Discussion was lively and informal and focussed on aspects of health and nutrition, money for food, food supply and a healthy 'recipe of the week' which was made available on the 3KND website (http://www.3knd.org.au). Twenty-two radio programs included the nutrition segment. This was evaluated by the number of hits on the recipe web page and a 10 item questionnaire (electronic or paper based). A total of 2154 people visited the 'recipe of the week' website over the course of the pilot, an average of 98 visits per week. Thirty-five people (23 Indigenous) chose to complete the questionnaire, of whom 18 (51%) reported listening to the nutrition segment weekly. Participants reported high levels of appreciation of both session content and delivery, and also some consequent behaviour change (for example, 20% swapping to low fat milk). This novel, low profile intervention is further evidence of radio media being a valuable culturally targeted health promotion tool for Aboriginal communities, and appears to be empowering healthy eating behaviour change amongst the listeners.

274. IMPACT OF SUBSIDISED FRUIT AND VEGETABLES ON THE HEALTH AND NUTRITION OF ABORIGINAL CHILDREN

ANDREW BLACK, KERRY HAMPSHIRE, **FIONA SMITH**
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Nutrition is a significant factor supporting health. Australian surveys have shown that social disadvantage correlates with poorer health outcomes, higher rates of chronic disease and lower adherence to nutrition guidelines. This is most obvious in the life expectancy gap between Aboriginal and Torres Strait Islander people and non-Indigenous Australians. In this context the evaluation of the effectiveness of interventions to improve nutrition are important to guide policy development. An evaluation was undertaken of a subsidised fruit and vegetable program for disadvantaged Aboriginal families at three rural Aboriginal Health Services. The impact of the program was assessed using 24 hour dietary recalls and biomarkers. Health outcomes were assessed retrospectively using clinical record audits. Focus groups and key informant interviews were used to document the implementation and sustainability of the subsidy program. 57 new families were recruited to a before and after comparison. Baseline assessment in 149 children showed low levels of fruit and vegetable consumption. The impact on biomarkers, diet, and health outcomes for 129 children after 12 months will be presented. There were improvements in biomarkers indicating increased fruit and vegetable consumption and improvements in health outcomes. Knowledge of the social and environmental determinants of health emphasise the need for strategies to complement individual health promotion approaches. Healthy food subsidy programs and research have expanded internationally. This program evaluation will contribute to understanding the role of food subsidies to improve the nutrition of disadvantaged Australians, particularly Aboriginal and Torres Strait Islander people.

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135. GOOD QUICK TUKKA: WHAT HAVE WE LEARNT?

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The Good Quick Tukka (GQT) cooking program aims to increase the number of meals prepared at home and to pass new found cooking skills to others among Aboriginal and Torres Strait Islander people. A pilot program reaching 256 people was run and evaluated using a combination of quantitative and qualitative analyses. Participants identified enablers for cooking at home were quick and affordable meals, increased knowledge and more practical assistance with meal preparation. After completing the program, participants had increased knowl-

edge, confidence and skills to prepare meals. However, participants did not report passing on the skills and knowledge they had gained on to others. Barriers to the program's success included high staff turnover, ongoing funding, and the capacity of current health workers to include the program in their current work schedules. As a result of the evaluation, the program has been identified as worthwhile continuing however, will be modified to include a facilitator's manual incorporating a pass-on concept with additional incentives. In addition, strategies will be developed to seek support from CEOs of individual community controlled health services; access additional funding and support from community organisations and broaden the target group to include youth with mentorship provided by Elders. This presentation will outline the progress and outcomes of the GQT program implemented within Queensland.

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821. ECONOMIC EVALUATIONS FOR PROTEIN AND ENERGY SUPPLEMENTATION: WHERE IS THE EVIDENCE?

RACHEL MILTE, JULIE RATCLIFFE, MICHELLE MILLER, MARIA CROTTY
Flinders University, Australia

Economic evaluations are increasingly recognised as an important component of health technology assessment in determining the relative costs and benefits of competing interventions within health care systems. We conducted a literature review to identify economic evaluations of energy and protein supplementation for individuals with or at risk of malnutrition. Electronic databases including but not limited to MEDLINE, and the Cochrane Library were searched for studies replicating the search strategy of Milne *et al*. (2009) in all adults (excluding those based in patients with metastatic disease and in critical care). Of the 1498 studies identified by the review, only 14 (1%) included an economic component; 8 RCTs, 1 quasi-randomised controlled trial, 1 cross-over quasi-randomised study, 1 historical controlled study, 1 prospective cohort study, and 2 economic models. Methods of economic evaluation were similarly broad; with only 2/14 studies including a cost utility analysis with a generic quality adjusted life years (QALY) outcome. Both studies were focused upon oral nutritional supplements and indicated cost effectiveness according to internationally adopted cost effectiveness thresholds. A further 5/14 included a cost effectiveness analysis with a nutrition specific outcome, 2/14 a comprehensive cost analysis, and 3/14 included a simple cost analysis. 2 included economic modelling. The Milne review and other studies have demonstrated clinical effectiveness of protein and energy supplementation. However, in a world of increasing resource constraints, without properly conducted economic evaluations the evidence base for the provision of these and other nutrition interventions remains incomplete.

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960. STRATEGIES TO INCREASE THE USE OF DIETETIC SERVICES IN AN URBAN INDIGENOUS HEALTH SERVICE

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Aboriginal and Torres Strait Islander people generally access fewer dietetic services than other Australians, although they experience a greater burden of disease from conditions for which dietetic services are beneficial. This paper reports on a project implemented to increase use of the dietetic services at an urban health service for Aboriginal and Torres Strait Islander people. At this health service the number of patients increased from just 12 in 1995 to over 5000 in 2011. The dietetic services had to address many challenges to meet the growing needs. The strategies used to increase access to dietetic services have been successful – referrals and access to the dietetic services have increased considerably. Innovative strategies included the dietitian spending time at community events to learn from community members and providing food demonstrations in the waiting room to facilitate engagement with more patients and raise awareness about dietetic services. Other strategies included increasing the days available for clinic consultations and making additional space available, providing education to the clinic staff about dietetic services, improving the dietetic referral processes, and adopting effective communication styles. Focus groups with patients and clinic staff will be conducted in early 2012 to explore their experiences of the expanded dietitian services. This presentation will compare referral and attendance data for the years 2009 to 2011 to show the increases in the dietetic service access and provide case studies demonstrating health improvements resulting from the increased uptake of dietetic services.

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6.3 Nutrition in Institutions

95. THE HEART FOUNDATION'S ADVOCACY AND THE INTRODUCTION OF MENU LABELLING IN FAST FOOD CHAINS IN AUSTRALIA

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The relationship between what we eat and drink, our health status and our environment is well established. Eating out is now a part of the Australian lifestyle with 1.6 billion meals in 2009 being served in fast food outlets, of which 60% were quick service (fast food) restaurant and snack food chain stores (BIS Shrapnel, 2009). This means that 4.5 million Australians visited a fast food outlet every day in 2009. With heart, stroke and blood vessel disease accounting for 34% of all deaths in Australia (ABS, 2010), and poor eating a major risk factor, the Heart Foundation's focus is on making healthier food choices the easier choices. Part of our work involves advocating for governments to: legislate and enforce mandatory nutrition labelling on menus and menu boards at point-of-purchase; fund and run an education campaign about what menu labelling means and how to use it; monitor and evaluate the menu labelling initiative; and support further research. This presentation will outline how collaboration and good evidence led to success in this national campaign. This presentation will step through the preparation of the evidence paper drawing from overseas experiences to inform our government recommendations; the advocacy activities undertaken including using a key advocate to champion our message and including another health organisation; and the ongoing activities to support the outcomes from our advocacy work. Key actions, learnings and outcomes will be presented in a practical manner that will help inform potential actions in future public health advocacy campaigns.

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611. PROTECTED MEALTIMES IN THE AUSTRALIAN CONTEXT: ENCOURAGING, ASSISTING AND TIME TO EAT

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Protected Mealtimes is a strategy in hospitals in the United Kingdom, whereby non-urgent patient interruptions are limited at mealtimes in order to improve intakes. Recent evaluation studies report difficulties

in implementing Protected Mealtimes in the UK with limited improvement in patient outcomes. This has not been explored in the Australian context. Protected Mealtimes were introduced on medical wards of a large teaching hospital in Brisbane, Australia. Rather than focusing only on mealtime interruptions (as per Protected Mealtimes in the UK), an action research approach was used to create a mealtime environment where nursing, medical and allied health staff provided enhanced assistance and encouragement. Data were collected on consented patients aged ≥65 years (pre-intervention: n = 115, post intervention: n = 81). Process outcomes were measured, including mealtime assistance and interruption levels. Food intake was visually estimated on a single day during first week of hospitalisation, with energy intake calculated using food composition data and compared with estimated requirements. There was no significant difference in mealtime interruptions. However, significantly more feeding dependent patients received mealtime assistance (96% vs. 61%, $p < 0.001$). In addition, significantly more patients met their estimated energy requirements (26% vs. 8%, $p = 0.001$). Protected Mealtimes can achieve improved process and nutritional outcomes, when implemented using an action research approach. A focus on mealtime assistance and encouragement, rather than just "protecting" the mealtime, is essential. However 74% of patients still failed to meet nutritional requirements, suggesting a need for multiple strategies to increase the nutritional intake of elderly inpatients.

Funding source: Queensland Health (QH) Strengthening Aged Care, QH Health Practitioner Research Scheme. Scholarship funding from Queensland University of Technology and Royal Brisbane and Women's Hospital

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496. SUSTAINING PRACTICE AND OUTCOMES FOLLOWING IMPLEMENTATION OF A MALNUTRITION STRATEGY IN AN ACUTE CANCER SETTING

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Malnutrition is highly prevalent in the oncology population. An effective and financially viable model with significant positive clinical outcomes has previously been demonstrated with the implementation of an evidence-based, structured malnutrition strategy. This study aimed to determine if positive clinical outcomes were sustained 6 months following the implementation of a malnutrition screening, assessment and treatment strategy in an acute cancer setting. Comparisons from the pilot of a model of care completed in 2010 (n = 1,213) were made to data collected up to 6 months post-implementation. High malnutrition screening rates were sustained from the pilot (95% of patients admitted for >1 day) compared to 6 months post-implementation (93%). The percentage of patients under the care of the dietitian who maintained/improved their nutritional status remained relatively stable (85% in pilot compared to 80% 6 months on). Median length of stay of malnourished patients continued to decrease over time (8.0 days in pilot compared to 6.2 days 6 months on). The number of patients coded for malnutrition was maintained (average 75 patients/month with pilot compared to 75 patients/month 6 months on) and reimbursements directly attributable to malnutrition coding slightly decreased (average $51,000/month in pilot compared to average $43,000/month 6 months on). This data demonstrates that many positive clinical outcomes were sustained 6 months following the implementation of a structured malnutrition strategy. This work provides valuable insight into effective methods for sustaining nutrition care practice and outcomes in an acute oncology setting and could be transferable to other settings in addressing malnutrition.

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351. HOW DO AUSTRALASIAN HOSPITALS IDENTIFY AND MANAGE MALNUTRITION IN THEIR ACUTE CARE WARDS?

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One aim of the Australasian Nutrition Care Day Survey was to explore nutrition care practices in acute care hospital wards across Australia and New Zealand. Managers of Dietetic departments completed a questionnaire regarding ward nutrition care practices. Overall, 370 wards from 56 hospitals participated. The median ward size was 28 beds (range: 8–60 beds). Although there was a wide variation in full-time equivalent availability of dietitians (median: 0.3; range: 0–1.4), their involvement in providing nutrition care across ward specialities was significantly higher than other staff members (χ^2, $p < 0.01$). Feeding assistance, available in 89% of the wards, was provided mainly by nursing staff and family members (χ^2, $p < 0.01$). Protected meal times were implemented in 5% (n = 18) of the wards. Fifty-three percent of the wards (n = 192) weighed patients on request and 40% (n = 148) on admission. Routine malnutrition screening was conducted in 63% (n = 232) of the wards and 79% (n = 184) of these wards used the Malnutrition Screening Tool, 16% (n = 37) the Malnutrition Universal Screening Tool, and 5% (n = 11) other tools. Nutrition rescreening was routinely conducted in 20% of the wards. Among wards that implemented nutrition screening, 41% (n = 100) routinely referred patients "at risk" of malnutrition to dietitians as part of their standard protocol for malnutrition management. Results of this study provide new knowledge regarding current nutrition care practice, highlight gaps in existing practice, and can be used to inform improved nutrition care in acute care wards across Australia and New Zealand.

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517. KIDZ ON HEN – THE PARENT/ CARER PERSPECTIVE

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Research has suggested Home Enteral Nutrition (HEN) services across NSW are uncoordinated and inequitable (GMCT, 2007). The Kidz on HEN project was undertaken to improve coordination and access to services for children on HEN therapy. The diagnostic phase involved an analysis of the Western Child Health Network (WCHN) Paediatric HEN population, and current services. As part of this process, a written questionnaire was developed for Parents/Carers of children on HEN to obtain feedback on their experience with HEN services and seek suggestions for improvement. Four hundred and forty four questionnaires were distributed via Clinicians at Public Health Facilities within WCHN and 111 were returned for quantitative and qualitative analysis. The average age of the children was 7.5 years and average duration on HEN was 5 years. Eighty six percent were fed via gastrostomy. Forty percent of Parents/Carers reported enteral feeding as their child's sole source of nutrition. Eighteen percent of Parents/Carers reported that the education and information received pre discharge was inadequate and inconsistent. Forty two percent of Parents/Carers reported dissatisfaction with access to services and Health Professionals; and thirty six percent were dissatisfied with follow up post discharge. The even spread of dissatis-

faction across WCHN suggests access is less about location and more about support before and after discharge. Coordination of ongoing care and communication between Clinicians; and between Parents/Carers and Clinicians were identified as areas for improvement. Lessons learnt have led to the development of tools to improve communication and quality of care.

Funding source: Western Child Health Network

619. PREPARATION AND ORGANOLEPTIC EVALUATION OF CALCIUM RICH RECIPES

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Calcium is one of the most essential mineral in the body, available through diet. Dairy products are the richest source of calcium but not liked or tolerated by everyone, moreover these products are getting costlier every day. Therefore, there is need to explore calcium rich foods other than dairy products and their use in day to day life arouses. Keeping this in view, the present study was undertaken with the main objective to formulate calcium rich recipes from locally available common foodstuffs other than dairy products. Five recipes namely: Khus khus coconut ladoo (poppy seed coconut balls), til ladoo (sesame sweet balls), idli (Indian fermented breakfast and evening snakes), pancake and coconut burfi (coconut dessert) were formulated. Organoleptic evaluation of all food preparations were conducted by a panel of ten judges using Hopkin's seven point scale. Among the formulated recipes idli (518.5 mg/100 g) was having highest calcium content followed by til ladoo (517.6 mg/100 g), khus khus coconut ladoo (515.2 mg/100 g), coconut burfi (515.05 mg/100 g) and pancake (514.9 mg/100 g) respectively. The overall acceptability of all the recipes was equally good with marginal differences. It may be concluded from present study that these recipes ensure good availability of important mineral like calcium, at low cost. The recipes formulated not only have an edge over dairy products but also help a person to meet RDA of calcium. Further consumption of these recipes daily will prevent the risk of calcium deficiency in different stages of life.

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953. DEVELOPING A NOVEL NUTRITION SUPPORT PROGRAM TO IMPROVE OUTCOMES FOR AMBULATORY PATIENTS IN THE CHEMOTHERAPY DAY UNIT (CDU)

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Peter MacCallum Cancer Centre, Australia

Malnutrition is common in oncology patients undergoing chemotherapy, which can compromise quality of life (QoL) and other clinical outcomes. This project aimed to pilot and evaluate the feasibility and acceptability of a proactive model of care encompassing targeted malnutrition screening and assessment, effective workforce planning through use of a nutrition assistant and provision of a fortified food model to ambulatory patients attending the Chemotherapy Day Unit (CDU). Data was collected pre-implementation (baseline, n = 95) and post-implementation (pilot, n = 99) of the model of care. Nutritional risk (Malnutrition Screening Tool), nutritional status (Patient Generated-Subjective Global Assessment) and QoL (European Organisation for Research and Treatment of Cancer Quality of Life Questionnaire, EORTC-QLQ C30) were evaluated in week 1 and 6 of chemotherapy. Unplanned hospital admissions and chemotherapy treatment outcomes were evaluated 12 weeks post chemotherapy commencement. The new model of care demonstrated improved nutrition screening rates (0% vs 95%), food provision, patient and staff satisfaction and reduced occurrence of chemotherapy dose delays (18.9% vs 8.1%), dose reductions (20% vs 2%) and LOS of unplanned admissions (7 days vs 4 days). The new model did not show statistically significant improvements in QoL, nutritional risk, nutritional status, or unplanned admission rates. This project demonstrated that positive outcomes can be achieved through the use of an evidence based, structured and workforce efficient nutrition support program. Further research is required to determine the optimal type and frequency of nutrition interventions and whether nutritional and clinical outcomes can be improved over a greater time period of intervention.

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6.4 Food Security

LEAD SESSION: *DEVELOPMENT OF BIOFORTIFIED RICE TO PREVENT IRON DEFICIENCY IN DEVELOPING COUNTRIES*

ALEXANDER JOHNSON
Abstract no received for publication

712. LIFTING THE BAR – USING A THREE-PILLARED APPROACH TO BETTER ADDRESS FOOD SECURITY WITH AUSTRALIA'S MOST VULNERABLE

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While food insecurity across Australia is generally reported as affecting around 5% of the population, amongst some vulnerable groups this can be as high as 75%. Australian Red Cross is engaged in food security programs with the country's most vulnerable people, including refugees and asylum seekers, remote Aboriginal communities and homeless people of all ages. Given that global and local challenges are further threatening food security we have reviewed, renewed and improved our approach to better provide holistic, sustainable solutions to build the internal capacity of communities to cope with these challenges and improve their long-term food security. The new framework emphasises the 3 pillars approach to address the key structural and systemic factors of food availability, access and utilisation. We work at the invitation of communities, with a community development approach, using asset mapping and a range of methods that drive local action by harnessing inherent strengths of communities and individuals to improve the lives of vulnerable people. By integrating these key concepts, innovative food security programs and projects have emerged and developed that are purpose-fit to the unique communities with which we work. Communities are realising successful food security outcomes as a result of programs ranging from community-based co-ops, kitchens and gardens through to clinical maternal and child health programs in remote areas.

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668. INVESTIGATING FOOD INSECURITY AND PHYSICAL ACTIVITY IN YOUTH HOMELESSNESS: THE YHUNGER#2 PROJECT

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Little is known about food security and physical activity opportunities for homeless young people in Australia. The Younger Hunger (YHUNGER) project was originally implemented in selected youth accommodation services in central Sydney as a life skills package to

improve food access for young people who are experiencing or are at risk of homelessness. A needs assessment (YHUNGER#2) was completed to evaluate the implementation, cultural relevance and accessibility of the YHUNGER project as well as investigate issues associated with food security, nutrition and physical activity preferences for homeless young people. It also aimed to determine the capacity and strengths of youth accommodation services to develop living skills and provide access to nutritious food and physical activity opportunities. The needs assessment was completed in sixteen youth accommodation services across Sydney. It consisted of interviews with youth services as well as focus groups and structured food interviews with a sample of young people. Qualitative and quantitative measures were used to analyse the information obtained. Preliminary results indicated that young people experienced varying degrees of food insecurity, despite being in supported accommodation services. Issues of poverty, persistent hunger, time limitations, reduced food access and youth culture were common and affected nutrition and food choices across all services. Further results and outcomes of the needs assessment will be discussed with reference to the sustainability of the YHUNGER project in addressing food access in a diverse homeless youth population. Opportunities for youth advocacy as well as capacity building with youth accommodation services will be identified.

Funding source: Community Health Services in Sydney and South West Sydney Local Health Districts, NSW Health, Australia

205. WHEN DIABETES AND FOOD INSECURITY INTERSECT: AN EXPLORATION OF THE EXPERIENCE OF ADULTS IN A LARGE URBAN CENTRE

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Much of diabetes-related research has targeted biomedical and lifestyle risk factors, often overlooking the importance of the social determinants of health and their effects on diabetes self-management. The goal of our research, therefore, was to explore the experiences of adults living with food insecurity and diabetes. Through a narrative approach, semi-structured interviews were conducted with 21 adults in the Greater Toronto Area, who experienced food insecurity in the past 12 months. Identified themes describe: barriers to acquiring and preparing healthy foods, such as inadequate funds, skills, and time; psychosocial distress around meal planning for one; obtaining nutritious food being a competing priority to other self-management behaviours such as ongoing access to chiropody and dental services, lancets and needles; the challenges of adapting to the taxing complications of diabetes and the autonomy to self-manage; and the reliance on compassionate relationships with health care providers and various coping strategies to provide hope for this potentially transient phase in their lives. Being food insecure significantly impairs the ability to manage diabetes. Based on participant responses, health care providers need to assess the level of meal planning and cooking skills given individuals' financial limitations, and be aware of the supportive resources to assist in the development of coping strategies. Advocacy is necessary to ensure greater affordability and access to "healthier foods" for those living with food insecurity and managing a chronic disease, such as diabetes, where diet is a critical facet of self-management.

Funding source: The Ryerson University Faculty of Community Services Seed Grant

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375. THE ASSOCIATION BETWEEN GLYCEMIC INDEX, GLYCEMIC LOAD, GRAIN INTAKE AND NUTRIENT ADEQUACY IN GESTATIONAL DIABETES MELLITUS

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Changes in the quality and quantity of carbohydrate foods may compromise nutrient intake in women with gestational diabetes mellitus (GDM). We hypothesised that a lower glycemic index (GI) or low glycemic load (GL) diet may improve overall nutrient intake. Specifically we aimed to investigate the food and nutritional intake of women with GDM and compare with Australian recommendations and evaluate the relationship between GI, GL, intake of cereal grains, and nutrient intake. Eighty-two women with GDM completed a three-day food record following their initial group nutrition education session post GDM diagnosis. Nutrient intakes were compared to the Australian Nutrient Reference Values (NRV). Pearson's correlation coefficients between GI, GL, grains, cereal products and nutrient intake were calculated. Nutrient intake across energy adjusted tertiles of GI, GL, carbohydrate intake, and intake of grains and cereal products were also compared. The majority of women (79 to 100%) did not meet the NRV for saturated fat, fibre, folate and iron. Lower GI and GL, but not carbohydrate intake, was significantly associated with higher intake of various micronutrients, including folate ($p < 0.01$), riboflavin ($p < 0.05$) and potassium ($p < 0.001$). Higher grain intake was associated with lower intake of saturated fat ($r = -0.363$; $p < 0.01$), but also lower micronutrient intake. Australian women with GDM are at risk of nutrient deficiency, especially those with higher dietary GI/GL or grain and cereal product intake. A low GI eating pattern may be nutritionally advantageous.

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307. SHAPING THE FOOD CHAIN TO MAKE IT EASIER FOR AUSTRALIANS TO EAT WELL

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Society is speeding up. More work. Less time. And it's only getting worse. Is it time for us – as dietitians – to acknowledge the inexorability of society choosing convenience over health, and work closer with industry on healthier choices? This case study explores the concept that convenience food doesn't have to be synonymous with junk food. Realising that health alone is not a compelling enough reason for many people to eat well, Lite n' Easy, a privately owned Queensland-based company, set out to produce a healthy, convenient solution. Under the direct guidance of a dietitian, this menu is formulated to meet relevant, evidence-based nutritional criteria. However, understanding the commercial realities of the food industry, flavour and meal enjoyment remain paramount. As much creative energy goes into making meals as delicious as they are healthy. As a result, because customers don't feel deprived, they are more likely to stick to it. The nutritionally balanced meals also act as a teaching model for portion size as well as introduce healthy foods not normally eaten. The success of Lite n' Easy raises an increasingly confounding question: Why is it so easy to find junk food, and so difficult to buy healthy fast food? As dietitians, how can we make it easier for Australians to eat well? As evidenced by this case study, dietitians need to be proactive in shaping our future food supply. Our involvement in industry or food service must be acknowledged, supported and encouraged by the profession.

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6.5 Rural Health

The first three abstracts for this session were not decided before publication

175. LIFE AFTER MAJOR UPPER GASTROINTESTINAL SURGERY – A QUALITATIVE STUDY

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Previous qualitative research in people having had major upper gastrointestinal surgery has focused on the initial months after surgery. Findings indicate people struggle with adjustments to eating and body weight. The aims of this study were to explore the long term impact of major upper gastrointestinal surgery on peoples' relationship with food. Eighteen males and 9 females having had major upper gastrointestinal surgery greater than 6 months ago were recruited, with a mean age of 68.7 years (±13.5). Semi-structured interviews were used to explore behavioural, social and emotional issues around food following surgery. While people continue to have symptoms of bloating, nausea and malabsorption there appears to be an acceptance of these symptoms as an unavoidable consequence of surgery. Individuals reported that food and eating was less enjoyable than prior to surgery and people avoided social and cultural occasions involving food that may worsen their symptoms. Despite weight loss with surgery, low body weight was only a concern for those people who were very underweight. Health professionals need to be more vigilant for symptoms after major upper gastrointestinal surgery because patients themselves appeared unlikely to complain. Dietary counselling might be helpful to address social limitations concerning food as well as improve overall nutrition and symptom management.

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575. DIETARY FAT INTAKE AND NUTRITIONAL STATUS OF WOMEN IN A LOW-INCOME RURAL COMMUNITY IN SOUTH AFRICA

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The cardiovascular disease (CVD) death rate is high in all population groups in South Africa (SA) and there has been a significant increase in diseases of lifestyle, specifically CVD, in the black population. The main aim of this study was to examine dietary intakes of total fat, saturated, monounsaturated and polyunsaturated fatty acids, especially linoleic and alpha-linolenic acids in healthy women in a rural community. The participants included a convenience sample of 207 women. Weight, height and waist measurements were taken and three 24-hour recall questionnaires completed for each participant. Registered nurses drew blood from the *vena cephalica* of seated women after an 8-hour fast and measured blood pressure. Data were analysed for descriptive statistics (means and standard deviations [SD]) and compared with reference values. Participants were divided into normal weight, overweight and obese groups and analysis of variance was done to determine significant differences between and within the groups. Pearson correlations were done to determine the associations between parameters. The results of this study indicated that overweight (26 per cent) and obesity (41.9 per cent) were the main problems in this group of women. Serum cholesterol and triglyceride levels were within the normal range; however, the mean serum LDL- and HDL-cholesterol levels were high and low respectively. Total dietary fat and fatty acid intakes were low. It can be concluded that in this low-income, rural community, that despite low dietary macronutrient intakes, risk factors for CVD are prevalent among the women in this rural community.

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622. DIETARY INTAKE PATTERNS AND NUTRITIONAL STATUS OF WOMEN IN A LOW-INCOME RURAL COMMUNITY IN SOUTH AFRICA

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In South Africa (SA) both over- as well as under nutrition in addition to the HIV and AIDS pandemic are prevalent with over nutrition and the resulting diseases of lifestyle contributing to 37% of all deaths in 2000 and nutritional deficiencies accounting for 1.2% of all deaths. The main objectives of this part of the project were to determine the nutritional status and dietary intake patterns of 383 randomly selected women in rural Qwa-Qwa, SA. A 24-hour recall was administered by trained enumerators on three occasions. Anthropometric measurements included height, weight and waist. Data were statistically analysed for means and standard deviations and compared with reference values/cut-off points. The results indicated deficient intakes for all the nutrients, except for carbohydrates and chromium when compared with the estimated average requirements (EAR). However, despite the mean adequate intakes, 38.1% and 70.1% of the women did not meet the EAR for carbohydrates and chromium respectively. The anthropometric results indicated that only 0.9% of the women were underweight compared to 26.0% and 41.9% overweight and obese respectively. These indices were confirmed by the mean waist to height ratio of 0.56 ± 0.49 in the overweight group and 0.64 ± 0.67 in the obese group compared to the 0.5 cut-off point for health. It can be concluded that this is a low-income community with compromised malnutrition. The results of this part of the project will facilitate planning and implementation of sustainable community-based interventions to address poor dietary intake patterns in this rural community.

Funding source: This project was funded by SANPAD

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269. AVAILABILITY AND COST OF HOME BRAND FOOD PRODUCTS ACROSS DIFFERENT REMOTENESS AREAS IN QUEENSLAND

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With the price of food increasing above the overall consumer price index in Australia, purchasing home brand (or generic) food products is a potential strategy for households to make healthy food choices more affordable. The aim of this study was to examine the availability of home brand products across Queensland and potential cost savings on a standard basket of healthy foods. The prices of 44 market brand and home brand products were collected in 78 stores across five remoteness areas in Queensland in May 2010 as part of the Healthy Food Access Basket (HFAB) survey. The HFAB feeds a family of six for two weeks. The mean cost of the HFAB based on market brand prices and the mean cost of the cheapest HFAB based on home brand prices were determined and compared by remoteness category. In 2010, the mean cost of the HFAB in major cities was $492.52, which increased to $620.71 in very remote areas. The HFAB reduced by 23.5% ($115.67) and 9.4% ($58.43) in major cities and very remote areas respectively if the cheapest home brand product was substituted where available. The availability of home brand products decreased with remoteness. People living in very remote towns have less opportunity to reduce the cost of healthy food by buying cheaper options. Improving the availability of home brand products throughout Queensland is one strategy to make healthy food choices more affordable.

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1040. EFFECTS OF DEFATTED SOY FLOUR SUPPLEMENTATION ON OBJECTIVE & SUBJECTIVE HEALTH MARKERS IN PRESCHOOL CHILDREN IN BUKOBA, TANZANIA

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Malnutrition is a primary contributing factor to childhood morbidity and premature mortality. The complexity of malnutrition transcends health issues, impacting children's growth, development and overall quality of life. Tanzania is ranked eighth in the world for greatest incidence of child mortality resulting from the synergistic interactions between moderate and severe malnutrition and infection. The study was aimed to determine the effect of Defatted Soy Flour (DSF) on objective and subjective markers of health and wellbeing in 100 children from three selected preschools in Bukoba, Tanzania. Objective health markers included growth data as height, weight and body mass index. Subjective health markers surveyed were presence of diarrhoea, symptoms of respiratory illness and health care access. The evaluation was expected to capture anthropometric and surface level health benefits of the addition of DSF to uji (porridge) in participants. Baseline surveys was conducted and anthropometric measures prior to the start of the soy feeding program and followed up at six months to determine the changes in nutrition status of the participants. The results of the trial indicated that linear velocity, with the exception of weight velocity, was unrelated to other variables. This can be interpreted as a positive indicator for the population's growth since both weight and height increased. The study concluded that addition of DSF as a protein source has a positive impact on growth and reduction of childhood malnutrition.

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6.6 Clinical Nutrition 1
LEAD SESSION: DEVELOPMENT OF PRACTICE BASED GUIDELINES

DR SUE ASH FDAA
Abstract not received for publication

491. MALNUTRITION IN WESTERN HEALTH HAEMODIALYSIS PATIENTS

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Western Health Renal Services (WHRS) were established in 2007, and have exceeded initial growth expectations of 6.5% per annum with haemodialysis (HDx) growth from June 2008 until present at 45%. Global research shows malnutrition is evident in 23–73% of HDx patients. Malnutrition increases morbidity and mortality, but also reduces quality of life (QOL) and increases hospital stay. Patients' responses to medical, nutritional, functional and social interventions for malnutrition have not been formally investigated at WHRS. All current WHRS HDx patients (N = 100) were selected. Patients were assessed twice, twelve months apart, using a validated nutrition screening tool (Subjective Global Assessment – SGA), and biochemistry, cause of renal failure, cultural background and dialysis duration were also noted. The initial population comprised 65% males, average age was 67.7 years and mean length on dialysis was 46.8 months. 62% of the population had diabetes, with diabetic nephropathy accounting for 41% of primary cause of renal disease. 57% of the population was classed as Non-English Speaking Background (NESB). The SGA indicated that 61% of patients had mild-moderate malnutrition initially, and fell to 30% after interventions from the renal dietitians over the six months. These two sets of baseline data have formed the basis of a Malnutrition Management Strategy for WHRS, improving quality and efficiency of malnutrition management and justifying malnutrition treatment strategies. The monitoring of patient's QOL and the establishment of NESB resources are required in the future.

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420. NUTRITION INTERVENTION WITH PHYSICAL ACTIVITY MONITORING IN PLHIV

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HIV infection has been associated with two-fold increase cardiovascular disease (CVD) risk. Lifestyle intervention; including diet and physical activity (PA) have been reported in reducing CVD risk in the general population, however there is little research conducted with people living with HIV (PLHIV). The aim of the study was to retrospectively investigate the level of PA in PLHIV who attended a lipid monitoring program and its relation to anthropometry and lipid profiles. PLHIV at an ambulatory HIV clinic participated in the program on a voluntary basis. Data on anthropometry, lipid profiles and PA level using self-administered International Physical Activity Questionnaire were obtained at baseline and week 12. All participants received nutritional counselling and advice on increasing cardiovascular fitness and/or resistance exercise. Thirty-one of 58 (53%) completed week 12 were analysed. Mean PA score increased significantly ($p < 0.0001$) from baseline compared to week 12 (2491 ± 2730 vs 4701 ± 3243 MET-min/week). At baseline 35% were grouped low PA. All participants (100%) achieved moderate or high level PA ($\chi^2 = 18.39$, $p < 0.0001$) at week 12. There were significant increases in vigorous ($p = 0.001$) and moderate ($p = 0.006$) PA scores. Significant reduction in total cholesterol/HDL ratio (–0.58 mmol/L, $p = 0.031$) were observed. Lean body mass change was +0.49 kg ($p = 0.059$). The study found an increase level of PA and showed a trend to have favourable clinical outcomes despite a short duration of follow-up. This highlights the need to assess and monitor PA in addition to individualised dietary advice. Referral to an exercise physiologist should be considered.

Funding source: The HAART to Heart Lipid Monitoring Service was partially funded by Bristol-Myers Squibb

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82. PATIENTS', NURSES' AND DIETITIANS' DEFINITIONS OF DIARRHOEA DURING ENTERAL NUTRITION

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Diarrhoea is one of the common complications in patients receiving enteral nutrition (EN). A previous study has shown that healthcare professionals (nurses, dietitians and gastroenterologists) do not agree on the relative importance of different characteristics used to define diarrhoea (Whelan *et al.*, 2003). The aim of the study was to investigate patients' and healthcare professionals' (nurses and dietitians) definitions of diarrhoea during EN. One hundred and twelve subjects (22 patients receiving EN, 57 nurses and 33 dietitians) were recruited to this cross sectional study and interviewed using a questionnaire that had been developed following an extensive literature review and pre-tested for clarity. There were differences in the ratings of importance of each characteristic used to define diarrhoea between the three groups, such as stool frequency ($p = 0.006$), quantity ($p < 0.001$), consistency ($p = 0.003$), colour ($p < 0.001$), odour ($p < 0.001$) and incontinence ($p < 0.001$). In general, the patients rated incontinence as the most important characteristic defining diarrhoea while healthcare professionals rated stool consistency and frequency as the most important character-

istics. Patients on EN used different characteristics to define diarrhoea compared with healthcare professionals. Therefore, healthcare professionals should be vigilant when gathering information from patients receiving EN as the information reported may potentially represent different actual experiences.

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246. TRANSDISCIPLINARY SCREENING AND INTERVENTION – AN OPPORTUNITY TO EXTEND DIETETIC PRACTICE

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The "Transdisciplinary Screening and Intervention Associated with Nutrition Cognition, Communication and Swallowing in an Emergency Department and Rapid Assessment Medical Unit out of Regular Business Hours" project is a Victorian Department of Health initiative to explore transdisciplinary approaches to screening and early intervention within the allied health professions. This project was funded for assess the impact of early screening and intervention for nutrition, cognition, communication and swallowing deficits in medical admissions in a large metropolitan hospital with no weekend dietetic or speech pathology service. The preparation phase involved selection of validated, widely used screening tools: Malnutrition Screening Tool, ASSIST (Acute Screening of Swallow in Stroke/TIA), Frenchay Aphasia Test & Butt Test of Non-Verbal Reasoning, and RUDAS (The Rowland Universal Dementia Assessment Scale). Consensus was obtained for early interventions, including the dietitian placing patients Nil by Mouth if they had suboptimal results on the speech pathology screens, and speech pathologists commencing high energy diets for patients identified with malnutrition. Staff recruitment included the appointment of a dietitian and speech pathologist to conduct the screens with medical patients on the weekend. Intensive training was undertaken to familiarise both disciplines with the screening documents and project scope. The project has successfully shown that transdisciplinary screening and intervention works within dietetics and speech pathology. The ability for dietetics staff to screen and offer first line intervention in areas of speech pathology practice holds opportunities for healthcare facilities where access to both dietetics and speech pathology staffing across weekends is not available.

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341. DIETARY INTAKES IN RELATION TO WEIGHT STATUS AMONG IRANIAN GIRLS WITH DOWN'S SYNDROME

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Down's syndrome is a genetic disorder in which the nutrient metabolism and weight balance is altered. The purpose of this study was to evaluate the dietary intakes of children with Down's syndrome in relation to their prevalence of overweight/obesity. This cross-sectional survey was conducted on 87 Iranian girls aged 3–12 years with Down's syndrome. Registered dietitians measured weight and height and evaluated growth according the growth charts developed specifically for Down's syndrome. Three-day dietary records were collected from mothers and data were analysed using the Nutritionist IV software. The prevalence of overweight and obesity were 35% and 40%, respectively. Total energy, carbohydrate and fat intakes of 98.9%, 80.1%, and 62.4% of children were above the Recommended Dietary Allowances (RDA) ($p < 0.001$). Intakes of folate in 97.1%, selenium in 92.3%, vitamin A in 82.3% and vitamin C in 79.0% of children were below the RDA ($p < 0.001$), with overweigh/obese children being at higher risks ($p < 0.00$). After adjusting for confounders, the risk of overweight and obesity decreased monotonically by moving from the first to the fourth quartile of vitamin A (OR: 0.47, 95% CI: 0.23–0.89), folate (OR: 0.63, 95% CI: 0.18–0.94) and selenium (OR: 0.71, 95% CI: 0.33–0.86) intakes (p-trend < 0.001). The high prevalence of overweight/obesity among children with Down's syndrome could be partly explained by their higher energy intakes compared to the recommendations. Since obesity was more prevalent among children with deficient nutrient intakes, educating parents on the importance of a healthy and adequate diet as well as addressing the behavioural determinants of obesity in this specific population seems essential.

6.7 Clinical Interventions

380. NUTRITION SCREENING IN HIP FRACTURE PATIENTS; FOR INTERNAL FIXATION OR PALLIATION?

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There is no gold standard for nutrition screening or assessment in hip fracture. Malnutrition prevalence ranges from 12–63% in this group (Hoekstra *et al.*, 2011). This pilot study aimed to determine whether the Malnutrition Screening Tool (MST) applied by different users accurately predicted malnutrition in a hip fracture unit. Prospective, consecutive data was obtained for all admitted patients for a convenience sample (n = 50). Independent screening was undertaken using the Malnutrition Screening Tool by nurses and by a trained nutrition assistant (NA). Malnutrition was diagnosed using ICD10-AM criteria via Subjective Global Assessment (SGA B or C) or body mass index (BMI; <18.5 kg/m^2) by an experienced dietitian. 50% of patients were malnourished. Screening completion rates were 82% by the NA and 66% by nurses. Moderate sensitivity and specificity were obtained for screens completed by the nutrition assistant (64%, 63%). Sensitivity was very high for nursing MST's (94%), with a moderate specificity (59%). Positive predictive values were similar for the NA (67%) and nurses (68%). Nursing screens had a much higher negative predictive value (91% versus 60%). There was poor agreement between NA and nursing screens (kappa 0.188). The high level of diagnosed patient delirium and/or dementia (56%) proved a major barrier to accurate and completed screening. A larger study is in progress to evaluate screening and assessment parameters in hip fracture patients as existing tools may not be suitable in this population with such a high level of delirium/dementia. In the interim, blanket referral and nutrition support should be considered given the high malnutrition prevalence.

Funding source: The Prince Charles Hospital Research Foundation

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237. ANTHROPOMETRIC CHARACTERISTICS AND BODY COMPOSITION OF PATIENTS IN CARDIAC REHABILITATION

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Cardiac rehabilitation refers to coordinated interventions designed to improve the cardiac patient's status. Candidates for cardiac rehabilitation are people after cardiac surgery, percutaneous coronary intervention, heart failure patients and any kind of cardiovascular disease. The programmes should include nutritional assessment and nutritional counselling. We intended to analyse and report the anthropometric parameters and body composition of our patients. We used a calibrated scale for measuring body weight and the Quadscan4000® (Bodystat

Ltd.) device for bioimpedance analysis. We analysed with descriptive statistics the BMI, waist circumference, body fat content and proportion, body fat mass index (BFMI) and body fat free mass index (FFMI). The mean age of the 100 randomly selected patient was 65 ± 10.1 years. Thirty six percent were men, 64% were women. Their mean waist circumference was found to be 112.6 ± 14.6 cm, and there were only 3 men and 1 woman whose waist circumference was shown below the cut-off value. Their mean BMI was 33.1 ± 6.0. The mean BFMI proved to be 13.6 ± 5.1, the mean FFMI 19.5 ± 3.1. The mean body fat proportion showed to be 40.1 ± 9.8% and the mean body fat content was 36.3 ± 12.5 kg. The mean Basal Metabolic Rate was found to be 1609 ± 284 kcal. Patients in cardiac rehabilitation have a waist circumference above the cut-off value, and also the BMI shows an obese population. Results of the bioimpedance measurements revealed the high fat content and proportion. These data serve as a baseline for our long-term nutritional management started with a 3 weeks period in hospital.

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233. IMPROVING CLINICAL OUTCOME IN PATIENTS WITH NON-ALCOHOLIC STEATOHEPATITIS USING INDIVIDUALIZED NUTRITIONAL ADVICE

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Non-alcoholic steatohepatitis (NASH) is the leading cause of liver enzyme abnormalities, which can proceed to cirrhosis and even hepatocellular carcinoma. The etiology is likely multifactorial with a baseline of steatosis. This steatosis may be due to many factors related to dietary intake and lifestyle. The aim of this study was evaluating the role of diet in induction and management of NASH. Dietary intakes of 42 patients with NASH referring to Taleghani Gastroenterology Clinic (Tehran, Iran) during 2009 were analysed by a validated 168-item food frequency questionnaire. Dietary intervention including a proper dietary intake and advice on increasing individual activities was applied for them, and its effect was assessed after 6 months. We did not find any significant differences between patients with NASH and healthy control population in the case of blood pressure, blood glucose, total cholesterol, and HDL cholesterol, but weight, height, BMI, waist, waist/hip ratio, and triglycerides, were significantly higher in patients than controls ($p < 0.05$). At baseline carbohydrate intake in patients (58 ± 3% kcal/day) was significantly more than controls (50 ± 10% kcal/day) while protein consumption was significantly lower in patients (11 ± 2% kcal/day) than controls (14 ± 4% kcal/day) ($p < 0.05$). We did not find any significant difference in the other dietary intakes. All anthropometric, biochemical, and histopathologic characteristics of the patients decreased after six months dietary intervention, however none of these differences were statistically significant. Our results indicate that dietary intake in patients with NASH is different from normal population, and a 6-month dietary and life-style consultation might result in improvement in clinical and para-clinical features of NASH.

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828. THE EFFECT OF DIFFERENT DOSES OF AN ARGININE-CONTAINING SUPPLEMENT ON THE HEALING OF PRESSURE INJURIES

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Pressure injuries are a significant clinical and financial problem for healthcare providers, and an internationally recognised patient safety problem. Improved healing rates have been demonstrated with arginine supplementation (6–9 g/day). This study aimed to determine whether equivalent healing rates could be obtained with supplementation of 4.5 g/day arginine. Twenty-three patients with a stage 2, 3 or 4 pressure injury were randomly assigned to receive 4.5 g or 9 g of a commercial arginine-containing supplement daily for 3 weeks. Subjective Global Assessment was performed at baseline. Pressure injury size and severity were assessed weekly using the Pressure Ulcer Scale for Healing tool. Treatment groups were similar for age, body mass index, albumin, haemoglobin and diabetes. There was a significant decrease in pressure injury severity over time ($p < 0.001$) with no evidence of a difference between the two arginine dosages ($p = 0.991$). Based on expected time-to-healing, patients in both treatment groups would be estimated to achieve an almost 2-fold improvement compared to historical control groups. Malnourished patients showed clinically significant impaired healing rates compared to well-nourished patients ($p = 0.057$) despite the different arginine dosages ($p = 0.727$). Similar clinical benefits in healing of pressure injuries can be achieved with a lower dosage of arginine which can translate into improved chance of compliance, and significant cost-savings for health care facilities and for patients.

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The remaining abstract for this session was not decided before publication

6.8 Food Composition

LEAD SESSION: FROM FOOD DATABASES TO DIETARY ASSESSMENT: A BEGINNING TO AN END APPROACH FOR QUALITY NUTRITION DATA!

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This paper reviews the historical basis of modern assessment of nutrient composition – from food composition tables and the transition to nutrient databases; it concentrates on these areas, beginning with the first, very crude printed food composition tables, to electronic food databases and continues to how dietary assessment is currently impacted by state of the art techniques and what that means for food composition. A plethora of studies, especially international studies, have utilized information from food composition via nutrient databases and software designed to extract food composition data into relevant files for dietary assessment. Globalization of food sources and need for continuity regarding dietary data presented challenges needing reconciliation. International concepts for food composition tables evolved to address these problems. United States Department of Agriculture's (USDA) nutrient data bank is widely used, even internationally, and concerns about its appropriateness in other locales needs to be addressed. A number of countries developed food composition databases unique to the foods of their population. International studies realized a number of problems related to inconsistencies between countries. Essentially, high quality food composition data requires up-to-date information on food supply, supplement use and potential food contaminants. Food composition tables form the basis for data published on nutrient intakes of individuals via food diaries, food recalls and surveys and, in addition, nutrient claims for some food products; thus accuracy and reliability are paramount. New tools in dietary assessment, such as food photography, make nutrient assessment more widely available, requiring even more attention paid to the accuracy of food composition databases.

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409. DETERMINING THE GLYCEMIC INDEX (GI) OF SOME VIETNAMESE FOODS RICH IN CARBOHYDRATE

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The aim of this study was to determine the glycemic index (GI) of some Vietnamese foods rich in carbohydrate. An experimental study on 12 healthy volunteers aged 22–31 years with no history of diabetes mellitus and others chronic diseases. The participants have been provided reference food (glucose) or test foods contain 50 gram carbohydrate and tested for blood glucose by using personal blood glucose-meter at minutes 0, 15, 30, 45, 60, 90 and 120. The glycemic index of each test food has been calculated by using area under the curve of test foods in 120 minutes divided to area under the curve of glucose. Low GI foods are those with GI < 55, medium GI foods when GI 56–74, high GI food when GI ≥ 70. Steamed thin rice pancake, rice vermicelli and broken rice have low GI (the GI are 38.7 ± 4.4; 51.2 ± 5.1 & 53.0 ± 6.6 respectively); bread has medium GI (55.4 ± 5.4); tai nguyen rice, red rice and sticky rice have high GI (73.6 ± 4.2; 75.1 ± 8.9; 79.7 ± 4.3 respectively). This initial study show that foods derive from rice including rice vermicelli, steamed thin rice pancake have low GI, tai nguyen rice (one of commonly used rice), red rice have high GI. More studies are needed to reach helpful recommendations for patients with chronic diseases especially diabetes mellitus.

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705. SUPEROXIDE ANION RADICAL SCAVENGING ACTIVITIES OF VEGETABLES, POTATOES, MUSHROOMS AND FRUIT JUICES

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Juices of 78 vegetables, 3 potatoes, 10 mushrooms and 54 fruits were investigated for their scavenging activities against superoxide anion radical (O_2) by the luminescence method with xanthine–xanthine oxidase system. IC_{50} measurements of all the samples were performed on five solutions ranging in concentration from 0.01 to 100% (w/v) of each sample juice. Juices from yellow and red peppers showed the most remarkable scavenging activities among all the samples, followed by juice of horseradish (wasabi) and cherry tomatoes. Carrot contains a large quantity of carotene, but showed a weak O_2 radical scavenging activity compared to other vegetables. Juices in this study contained only the water-soluble components, leaving the oil-soluble components in the samples. The weak O_2 radical scavenging activity of carrot may be due to absence of the oil-soluble components. Chinese green leaf vegetable (chingensai) and asparagus demonstrated the strongest O_2 radical scavenging activity among green and yellow vegetables. Other collared vegetables such as turnip, cabbage, onion, ginger root, garlic, radish-daikon and Chinese cabbage demonstrated strong O_2 radical scavenging activities. These results may be attributable to the total action of polypheno1, vitamin C and other compounds in water-soluble fractions. In the botany classification as edible parts, "fruit vegetables in solanaceas," "root and herbage vegetables in cruelferace," "root vegetables in nymphaeaceae" and "herbal vegetables in liliaceae" strongly scavenged O_2 radical. Juices from mushrooms showed an activity similar to those of red cabbage and cherry tomatoes. Juices of guava, lemon, kiwifruit, grapefruit and mandarin orange demonstrated strong activities.

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262. NUTRITIONAL MODELLING FOR CANCER PREVENTION DIETS

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A healthy balanced diet that includes seafood combined with regular physical activity can help to prevent some cancers including: prostate, colorectal and lung cancers. The Australian Guide to Healthy Eating (AGHE) was used to select food groups to model 14-day menu cycles for people at high risk of developing nutrition-related cancers. Commonly consumed foods (n = 456) were chosen from several validated databases and their energy and nutrient content was extracted using the Food Works program. Simulation tests were conducted to test optimal models using iterations of foods. Based on a 14-day menu (varying in the number of serves for each food group/day), simulations were run 1000 times (for example, 1000 combinations of 5 items of breads and cereals from the 46-item category) to provide mean energy and nutrient intake of the 14-day menu. Using this mean intake, it is possible to calculate the likelihood (%) that an individual would meet nutrient recommendations. Results indicate that a high seafood diet based on the core food groups, which meets nutrient intake recommendations for people at high risk of cancer, is achievable. It was concluded that consuming fish 5–7 times per fortnight is an appropriate way for target populations to meet fatty acid recommendations, as well as achieving core food group servings, without compensating nutrient intake or compromising energy intake.

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314. DEVELOPMENT OF A FOOD INSULIN INDEX (FII)

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A greater understanding of dietary insulin demand is important in the management of diabetes. Carbohydrate counting and glycemic index leave out a majority of non-carbohydrate foods in terms of predicting insulin responses. We developed a food insulin index (FII) for ranking iso-energetic foods (1000 kJ) according to insulin demand and systematically gathered available data. Published and unpublished data were collected between 1997 and 2008. To date, there are more than 120 different foods from nine categories of foods covering most of energy sources in western diets. All FII values of foods were tested in groups of 10 healthy subjects. Correlations between FII values and nutrients were examined. Significant differences in FII values were noted within and between food categories. Within food groups, insulin demand varied over a two-fold range among the vegetable group and over a 20-fold range among the fruit group. Carbohydrate, protein and fat, but not fibre, were related to insulin responses ($r = 0.68$, -0.26 and -0.51, $p < 0.01$). Consideration of food insulin index may be relevant to the dietary management and pathogenesis of insulin resistance, diabetes and associated complications and may also help increase the accuracy of estimating preprandial insulin requirement.

Funding source: Internal revenue, University of Sydney and Harvard School of Public Health

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80. NUTRITIONAL QUALITY OF AUSTRALIAN BREAKFAST CEREALS – ARE THEY IMPROVING?

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There is no systematic monitoring of the nutritional quality of Australian breakfast cereals (BFC) despite the importance of breakfast for general health. We therefore aimed to investigate whether the nutritional quality of Australian BFC has improved between 2004 and 2010, and whether the introduction of Daily Intake Guide (DIG) front-of-pack labelling has been associated with change. Supermarket surveys were conducted in 2004 and 2010 to collect information from the nutrition information panels of Australian BFC. Nutritional quality was assessed through reference to UK Traffic Light criteria. Nutrient content of BFC in 2004 and 2010, were compared as well as BFC with and without DIG labelling in 2010. The majority (64.2%) of BFC were considered high sugar. In 2010, 'cereals for kids' had significantly higher carbohydrate, sugar and sodium content (all $p < 0.05$), as well as lower protein and fibre content than other categories of BFC. No significant difference was detected in nutritional composition of BFC between 2004 and 2010, regardless of the presence of DIG labelling. Overall there has been little improvement in the nutritional quality of Australian BFC from 2004 to 2010. The majority of Australian BFCs were considered high sugar based on UK Traffic Light criteria. The introduction of DIG labelling has not resulted in appropriate product reformulation, and BFC carrying DIG labelling were not consistently healthier.

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Afternoon Concurrent Sessions – Session 7

7.1 Workforce Development, Specialisation and Continuing Education

786. HISTORY OF INSPIRATIONAL LEADERSHIP CULMINATING IN THE 1977 SYDNEY ICD

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The dietetic profession has had a rich tradition of honouring the achievements of past members. In relation to the conference themes of leadership and advancement of the profession, historical methodology was undertaken to gain a first person record of events that have great significance to the Sydney 2011 ICD event. Historical research methodologies include a family of research investigations that are time-specific and focus on uncovering the mysteries of the past. Oral history produces a primary source of material and a collection of evidence for permanent archival preservation. Following Charles Sturt University ethics approval an interview was undertaken with an eye witness participant, recalling the developments in the Australian dietetic profession leading up to the 1977 ICD meeting in Sydney. The initiative of pioneering Australian dietitians in the 1960s is recalled through the oral history recording with Bettie Richardson OA in August 2011. The interview describes the events of period and the challenges that lay ahead for the Australian dietetic profession in making the 1977 ICD event a reality. The leadership of the representatives from the Australian Dietetic Council were able to persuade members of other national dietetic association's to hold the 1977 ICD conference in Australia. The paper will be supported with other historical source material, but the use of oral evidence will be used to amplify information on specific events and in this recording has transformed the history of the time to be not just richer, more vivid, and heart rendering but truer.

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987. DIETITIAN PARTICIPATION ENHANCES GLYCAEMIC CONTROL IN DIABETICS – THE MALAYSIAN CORFIS TRIAL

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Malaysian dietitians participated for the first time in primary care through CORFIS, a 6-month multi-centre trial with locums providing care to diabetics attending CORFIS clinics. The intervention group (IG, n = 183) received dietitian care whilst the control group (CG, n = 81) was on standard treatment. Better clinical outcomes were observed for IG compared to CG for weight (–1.1 ± 0.2 kg, p = 0.001 *vs* –0.6 ± 0.3 kg, p = 0.060), waist circumference (–2.3 ± 0.3 cm, p = 0.001 *vs* –0.4 ± 0.7 cm, p = 0.058), HbA1c (–1.0 ± 0.1%, p = 0.001 *vs* 0.4 ± 0.1%, p = 0.001) and fasting glucose (–1.3 ± 0.2 mmol/l, p = 0.001 *vs* –0.2 ± 0. 3 mmol/l, p = 0.363). IG subjects achieved significant reductions in calories (–113 ± 30 kcal, p = 0.001), carbohydrate (–16 ± 4 g, p = 0.001) and fat (–5 ± 1 g, p = 0.001). Greater reduction in percent body weight with specific dietary advice such as 'eating out' (–2.5 ± 0.6% *vs* –0.9 ± 0.3%, p = 0.014) and 'recipe modification' (–3.1 ± 0.7% *vs* –0.9 ± 0.3%, p = 0.002) was achieved compared to omission. Similarly advice given or omission about carbohydrate counting significantly affected percent changes in HbA1c reductions (–11.7 ± 1.2% *vs* –6.7 ± 1.6%, p = 0.018). IG subjects with HbA1c <6.5% also reported lower percent carbohydrate-energy (52 ± 6.5%) intake compared to those with HbA1c >6.5% (54.6 ± 6.8%). A positive linear relationship (r = 0.258, p = 0.001) existed between percent carbohydrate-energy intake and HbA1c whereby every one unit increase in carbohydrate also increased HbA1c by 0.047%. In conclusion, dietitians enhanced glycaemic control in diabetic patients compared to the standard care model.

Funding source: The CORFIS Trial received funding (CT07-02) from the Clinical Research Centre, Ministry of Health Malaysia, Government of Malaysia

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810. U.S. ARMY MEDICAL SPECIALIST CORPS: CENTER FOR NUTRITION RESEARCH

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Nutrition, physical activity, and environment impact Warrior health and performance. The prevalence of overweight and obesity in the United States Army is over 60%, and their related co-morbidities continue to impact the number of eligible military recruits, strain the military healthcare system, increase risk for musculoskeletal injuries, and may ultimately impair combat readiness, and as a result have been identified as a top health threat for the Department of Defense. Soldiers that are "medically not ready" represent 69% of the military's non-deployable population. The current operational tempo requires comprehensive and effective prevention and early intervention strategies to ensure rapid return to duty of our nation's Warriors. The mission of the Center for Nutrition Research (CNR) is to promote military readiness through cutting-edge research and the advancement of evidence-based practice related to nutrition in disease, injury, and performance. CNR accomplishes this mission by integrating the results of clinical, biomechanical, and basic science research to develop optimal prevention and treatment strategies for beneficiaries of the military healthcare system and the overall population. This session will focus on the four research areas: Illness and Injury Prevention (nutrition needs of unique patient populations, micronutrient malnutrition); Disease and Non-Battle Injury Management and Rehabilitation (nutri-

tion support for the critically ill, chronic disease management); Combat Trauma Management and Rehabilitation (nutrition assessment, orthopaedic trauma and amputee research, burn management and rehabilitation research); and Health and Performance Optimization and Reintegration (weight management).

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76. CONSENSUS ON THE FUTURE COMPETENCY REQUIREMENTS OF PUBLIC HEALTH NUTRITIONISTS

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Competency standards provide the architecture for workforce development and serve to inform workforce preparation, continuing professional development and quality assurance via registration and credentialing systems. Developing consensus on competency requirements for the developing global public health nutrition workforce is therefore an important strategic initiative. This study aimed to assess the level of consensus amongst an international panel of public health nutrition leaders regarding the essential competencies required for effective public health nutrition practice. A modified Delphi study involving 3 rounds of questionnaires was administered amongst a panel of 57 public health nutrition leaders from government, academic and professional jurisdictions recruited from Australia, Indonesia, Finland, Thailand, Brazil, Canada, United Kingdom, USA and Ireland. The emphasis of the consensus development process was identification and prioritization of essential competency requirements for the future public health nutrition workforce. Ratings and open-ended responses to over 180 separate competency elements derived from the white and grey literature were categorised into 14 competency areas including enabling knowledge, analytical, nutrition science, public health systems, food and nutrition systems, communication, management, leadership, nutrition education, nutrition assessment, nutrition monitoring and surveillance, capacity building, intervention management and professional competency categories. This study builds on earlier findings that there is strong international agreement about the competency requirements for public health nutrition, reflecting a growing global consensus. Essential competency units identified can be used to develop and review competency standards for public health nutrition, with an eye to enhancing workforce development into the future.

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352. USING E-LEARNING TOOLS TO DELIVER CONTINUING PROFESSIONAL DEVELOPMENT – A CANADIAN EXPERIENCE

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Delivering evidence-based professional development curricula to dietitians across a country as vast and relatively sparely populated as Canada presents obvious challenges. At the same time, dietitians in all areas of the country and in all areas of practice face regulatory requirements to demonstrate their ability to provide professional, competent, current and ethical dietetic services, one aspect of which is assessed through documented participation in continuing professional development activities. With the array of communication tools and devices upon which to access information ever increasing, Dietitians of Canada (DC), sought to develop a suite of professional programs using new communications tools to provide accessible, evidence-based professional development tools and resources at the fingertips of time-pressed dietitians in all practice areas and settings in urban and remote communities. This presentation will describe how dietitians' interest in distance learning technologies was assessed through survey and focus group methods, and addressed using Dietitians of Canada's professional development e-learning program including pod cast and web cast presentations of various styles, in-depth on-line course work and telehealth technologies. By September 2012, preliminary evaluation results will be available as will future plans for the program. An analysis of cost factors, both for the association and the program users, will be included. The presentation will be of interest to dietetic association's seeking to ensure excellence in practice through continuing professional education programming but that also face challenges of geography and/or widely dispersed memberships.

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526. ALLIED HEALTH ROLES IN THE FIELD OF PATIENT SAFETY: LESSONS LEARNED

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The strategic intent of patient safety is to reduce preventable patient harm. While the literature and conference presentations are replete with examples of the value of multi-disciplinary teams, allied health disciplines are under-represented in patient safety roles. In Queensland Health (QH), pressure injury and falls are among the top three causes of harm reported in the QH incident reporting system. (Learning to Action IV) Malnutrition is highly associated with pressure injury, and at least doubles the odds risk of pressure injury in patients/residents of QH facilities. In 2010 a state-wide malnutrition prevention project was established on a Director General recommendation. The project implemented the recommendations of the 2008 project report: *Investigating Practices related to Malnutrition*. The QH project was the first dedicated malnutrition prevention to be established in an Australian patient safety jurisdiction. The aim of our presentation is to share the lessons learned and opportunities for Allied Health working in non-traditional roles – in particular as Program leads in state-wide falls injury and malnutrition prevention. Lessons learned include: (1) an integrated approach to the patient safety issues of falls, pressure injury and malnutrition prevention has increased program leverage and clinician engagement, (2) the medical and nursing leadership at the QH Patient Safety and Quality Improvement Service increased and enabled engagement of medical and nursing leaders and (3) allied health can bring expertise to compliment the primarily nursing workforce working in patient safety, and encourage a multi-disciplinary, holistic team approach to these issues.

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364. THE EVOLUTION OF A MODEL OF WORKFORCE DEVELOPMENT IN DIETETIC PRACTICE

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Since January 2009, Dandenong hospital has implemented a Model for Workforce Development involving a portfolio system to provide an opportunity for all dietitians to contribute to the formation, implementation and maintenance of key clinical initiatives and contribute to strategic directions within the department. Currently there are 12 dietitians covering 5 portfolios: Clinical; Workforce Development; Occupational Health and Safety; Food Service; and Quality and Research. Each portfolio consists of a Senior Dietitian as the facilitator and two to four dietitian members. The 2009 portfolio evaluation resulted in a decreased number of portfolios, the development of clearer objectives, and an improved reporting system. The 2010 evaluation resulted in the appointment of a second facilitator in each portfolio, immediate designation of new staff to a portfolio and a more structured reporting system. The 2011 evaluation will have three aims: review current facili-

tator effectiveness to determine further skill development required; to determine if junior staff feel that they are involved around decision making and communication; and to document staff perception in regards to the advantages and disadvantages of portfolios to dietetic service. A questionnaire addressing these aims will be placed on survey monkey. The questions will include qualitative data and also allow room for individuals to expand responses. The qualitative answers will be grouped for themes. To decrease evaluator bias all participants' responses will be anonymous. The results of these findings will be available in January 2012 and will be included in the final abstract for the conference.

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807. LEARNING TOGETHER WORKING TOGETHER

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Interprofessional education (IPE) is defined as 'occasions when two or more professions learn with, from and about each other aiming to improve collaboration and the quality of care'. IPE is increasingly recognised in health education literature but is scarce in relation to dietetics. The aim of this pilot project was to engage University of Otago Wellington health professional students from three health disciplines (dietetics, medicine, physiotherapy) in learning about chronic care management using principles from interprofessional education. A concurrent evaluation was undertaken. Educators from each discipline were involved in seven months of planning and delivery of the pilot. The class of 21 students, seven from each discipline, participated in a 'meet and greet' session, a 3-hour interactive interdisciplinary workshop on chronic care management, online fora, home-visits to patients with chronic conditions and presentations to the class. Subgroups of three, one student from each discipline, worked together on activities. Evaluation methods included peer feedback of subgroup functioning, before and after self-assessment of learning outcomes, online contributions and transcripts of discipline specific focus groups. Preliminary findings indicate dietetic students to be positive about their experience of IPE. The pilot enhanced their understanding of roles and responsibilities of the other disciplines, and gave them a broader understanding of chronic care management, although the extra workload was a challenge. The expansion of student networks within the Wellington campus was also seen as beneficial. With further refinement IPE could be incorporated into dietetic education in New Zealand to improve interdisciplinary collaboration and quality of care.

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7.2 School Nutrition Education Programs

1030. PROJECT YEAH: DEVELOPMENT OF A WEB-BASED INTERVENTION FOR PREVENTING EXCESS WEIGHT GAIN IN YOUNG ADULTS

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Investigators from 14 universities in different states of the USA employed the PRECEDE-PROCEED process of community-based participatory research process to identify and prioritize quality-of-life behavioural and environmental factors that influence weight gain in young adults (YA). These factors were assessed for the YEAH (Young adults Eating and Active for Health) intervention via focus groups, key informant interviews, quantitative surveys, and environmental audits, and results were used to guide the development of the intervention. YEAH was developed as a 10-week, web-based intervention with 19 interactive modules and nudges (stage-tailored messages) addressing issues highest-rated by YA: managing stress (time and sleep management, balancing relationships, and control of alcohol), improving eating behaviours (eating enjoyment, skills for choosing and assembling meals), incorporating physical activity, and managing weight with a non-diet approach. Nudges were developed to reinforce module content, cognitively tested, and sent 3 times/week via email. Participants were encouraged to set goals and track progress via YEAH's website. Anthropometric measurements, fruit and vegetable intake, physical activity, stress management, and sleep duration assessments occurred at baseline, post-intervention (10 weeks), and 15 months. YA (n = 1645, age = 19.3 ± 0.03 years, BMI = 24.1 ± 0.1, 66% female), who were non-nutrition/non-exercise science majors, were recruited and randomized, stratified by institution and gender into intervention (n = 824) and control (n = 815). At baseline participants reported consuming 3.4 ± 0.2 SEM cups fruit and vegetable, 2.7 ± 0.07 servings whole grain, 31% ± 0.2 of energy from fat, and obtaining 7.3 ± 0.04 hours of sleep/day. Community involvement in the development and implementation of YEAH has enhanced the intervention and increased the likelihood of a sustainable online, not-diet, weight management program for YA.

Funding source: National Research Initiative Grant 2009-55215-05460 from the USDA National Institute for Food and Agriculture

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928. EVALUATION OF THE 'BACK TO BASICS' AFTER-SCHOOL COOKING CLUB FOR CHILDREN AND THEIR FAMILIES FROM A SOCIO-ECONOMICALLY DISADVANTAGED COMMUNITY

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Few community nutrition intervention studies have been evaluated using constructs of Social Cognitive Theory (SCT) or have collected 6 month follow-up data. The aim of this study is to evaluate the impact of the 'Back to Basics' Cooking Club program on SCT measures relating to vegetable intake at 6 months post-intervention. Data were collected in February 2011, from primary school children (aged 5–12) and parents who had participated in a feasibility study at a low SES school in the Hunter Region of NSW. The after-school cooking club for children included an evidence-based nutrition component for parents. Dietary intake and constructs of SCT, adapted for vegetable intake, were assessed by an interview administered questionnaire. Effect size was calculated using a Cohen's *d* analysis. At 6 month follow-up from baseline, child (n = 9) scores for 3 constructs increased with a moderate to large effect size. Mean (SD) scores for, self-efficacy to prepare and eat vegetables (adjusted diff = 4.43 [5.8], Cohen's $d = 0.76$), the social environment (5.75 [4.8], $d = 1.2$), and self-control (4.55 [6.9], $d = 1.04$). However, increases in scores for situation (2.27 [3.4], $d = 0.26$), outcome expectations and expectancies (0.5 [3.77], $d = 0.13$) showed small effects. An after-school cooking club with a parental component can improve child self-efficacy, support and self-control in regard to preparation and consumption for fruit and vegetables. Further research with a larger sample will determine if the *Back to Basics* cooking club is effective at improving key mediators of behaviour change and increasing fruit and vegetable intakes.

Funding source: Newcastle Permanent Charitable Foundation

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754. INNOVATIVE IRON RICE FORTIFICATION STRATEGY COUPLED WITH SOCIAL MARKETING DECREASED ANAEMIA RATE AMONG SCHOOLCHILDREN

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Rice is consumed regularly by Filipinos and constitutes the dominant part of the diet. Therefore, it is an appropriate vehicle for iron fortification to combat the high prevalence of iron deficiency anaemia (IDA). This study aimed to determine the effects of commercializing iron fortified rice (IFR) on anaemia rate among schoolchildren. This took place in Orion, Bataan. About 766 mothers and their child aged 6–9 years participated in the study. Nutrition knowledge, attitude and practice (KAP) of mothers and nutritional status of their children were measured at start and end of the study. Soliciting political support, establishing networks, market survey, and social marketing were also conducted. Rice fortified with micronized dispersible ferric pyrophosphate using extrusion technology was sold in all rice outlets in the locality. The iron content of IFR was tested to ensure quality. As a result, a local law mandating the sale of IFR in all rice outlets was issued by the local government to make it more available and accessible to the people. Intensive social marketing have encouraged families to buy IFR. The iron content of IFR was within standard of 600 to 700 mg of iron per 100 gram premix. Anaemia rate has significantly decreased among children (17.5% to 12.8%). KAP of mothers were improved from start to end of the study. Commercializing rice fortified with micronized dispersible ferric pyrophosphate could be considered as one of the strategies in decreasing the rate of anaemia.

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519. ESTABLISHMENT, IMPLEMENTATION AND EVALUATION OF THE PHILIPPINE NUTRITION SCHOOL ON LINE

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Keeping in mind special needs and interests, and busy lifestyles, studying online is possible anytime, anyplace where a computer and internet access are available. The fnri nutritionschool.ph was conceived as a partnership between the food and nutrition research institute (fnri) and nestle Philippines, inc. (npi) built on their common concern for wellness. The project aimed to establish, implement, and evaluate the Philippine-based nutrition school online for years 1 to 3. Years 1 to 3 of the project involved website development, module development and pre-testing, implementation and monitoring, and evaluation. The evaluation utilized a pretested online questionnaire accomplished by enrolees, soliciting information on user characteristics, content, perceived effects of the school, problems encountered and recommendations for improving the school. Six modules with 40 lessons in beta version were developed by three expert writers, reviewed by a technical consultant and pretested among intended users. This version was later pretested among the early users to provide basis for finalization of the online school. The school generated 5,764 graduates with 3,774 given on-line certificates and reported 1,618,886 hits with 4 minutes and 26 seconds average time on site. Overall, the site was found accessible and was rated "very satisfactory" for general acceptability. With a "very satisfactory" general acceptability, the school may be considered as an effective nutrition education tool. However, there is a need to improve the content of the modules and overall design of the site. The continuation of the fnri-dost and npi partnership for the school is also recommended.

343. FOODMASTER: INTEGRATING NUTRITION EDUCATION INTO 4TH GRADE MATH & SCIENCE LESSONS

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The Food, Math, and Science Teaching Enhancement Resource (FoodMASTER) Initiative is a compilation of projects aimed at using food as a tool to teach math, science and nutrition. This National Institute of Health Science Education Partnership Award (NIH SEPA) funded project was aimed at creating a 10-unit curriculum using food as a teaching tool for 3rd–5th graders. In 2009–2010, nineteen 4th grade classrooms were chosen to implement the FoodMASTER curriculum in North Carolina (n = 8) and Ohio (n = 8). Teachers implemented hands-on activities covering food-related topics. After implementing the curriculum in their classrooms, 100% of teachers rated their experience as good or excellent and 100% thought the experience was valuable for their students. Teachers also reported the curriculum helped their students learn nutrition (94% "most or all the time") and positively impacted their enthusiasm for the topic (91% "most or all the time"). Additionally, the majority of teachers reported they would be willing to repeat most of the 10 units in their classroom (81% Measurement; 88% Food Safety; 69% Meal Management; 63% Fats & Oils; 63% Fruits;

56% Vegetables; 50% Grains) with the exception of Eggs (38%), Milk & Cheese (38%), and Meat, Fish and Poultry (31%). Finally, 100% of teachers reported being interested in continuing to use the FoodMASTER curriculum. Overall, teachers were excited to introduce nutrition topics while meeting academic standards for math, science, and nutrition. Formative and summative teacher-generated feedback from this 5-year project will serve as a resource to those interested in project processes and developing/evaluating educational materials.

Funding source: National Institutes of Health Science Education Partnership Award (NIH SEPA)

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499. A MODEL FOR PLANNING AND IMPLEMENTING NUTRITION EDUCATION PROGRAMS IN PHILIPPINE SETTINGS

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Nutrition education is essential for the public to achieve and maintain optimal nutritional health. Considerable evidence supports effectiveness of nutrition education in changing dietary intake to reduce risk factors for disease. The study presents the development of a model to enable nutrition educators to address the various concerns of patients and client groups. Using the five phases of development: needs assessment, preliminary planning and decision making, developing philosophy, goals and objectives, developing content, and writing; a core group of experts representing different fields of nutrition specialization had a series of consultation-meetings, exchanges of literature finds and conferences from 2006 to 2008 maximizing information and communications technology. The output was a *Nutrition Education Planning Cycle* consisting of six stages arranged in a cycle with the last stage feeding into the first, showing that nutrition education planning is a continuous process, with insights and lessons learned along the way serving as inputs for improving, refining and even modifying the program if necessary. The model was utilized by the authors for their book *Nutrition Education: Principles, Approaches and Strategies*, a useful textbook for Nutrition majors and allied professionals doing Nutrition Education activities. Sharing what has been learned from implementing a nutrition education program through a short paper for appropriate nutrition, public health, medical, and health education journals and technical paper for presentation at national or regional and local meetings is emphasized. Letting others know about the program may prompt them to describe similar experiences, lessons, new ideas, or potential resources for further programs.

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661. NUTRITION SCHOOL ON CAMERA (NSC): AN INNOVATIVE NUTRITION EDUCATION APPROACH IN PROMOTING FOOD AND NUTRITION MESSAGES

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The project aimed to disseminate food and nutrition information through a nutrition school on television and evaluate the school in terms of nutrition knowledge change among mothers. Its four phases included pre-production, production, airing and evaluation. Fifty-eight urban low-income mothers were asked to watch the 13 episodes of the school while 35 mothers who did not watch the episodes composed the control group. Both groups were given baseline and end line nutrition knowledge tests. During pre-production, technical scripts were prepared and later converted to production scripts for the episodes. Coordination with the expert as resource persons for the episodes was done. The episodes were produced and aired for one season by the partner government TV (IBC 13) under the tag name *Nutrisyon is Kool*, a 15-minute segment of the Rx *Nutrisyon at Kalusugan* program. Results showed that in 21 of the 30 test items, the percentage of mothers with correct answers increased from baseline to end line. Paired t-tests for the experimental group showed significant increase in scores by 2.8 points. The NSC provided a novel nutrition education approach being the first known school on Philippine national television. The study was effective in increasing nutrition knowledge among selected low-income mothers. However, it should be evaluated among non-captive viewer to determine its feasibility and effectiveness under normal, day-to-day activities. Furthermore, there is a need to study the long-term effect of the school, particularly on nutrition attitude and practice. This will mean putting up modules that will run for more than one season.

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7.3 Dietary Patterns and Behaviours 2

415. TRANSLATING PEACH™ FROM RESEARCH TO PRACTICE: WHY IS IT SO HARD?

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The PEACH™ in the Community project evaluates the translation of the effective PEACH™ family focussed weight management program (Magarey *et al.* 2011) from research to practice. The study aim is to describe the barriers to this process. Forty-five health professionals attended 2-day facilitator training and were provided with the necessary materials for program implementation in their work setting. Facilitators completed an evaluation questionnaire following program implementation or an alternative version if this had not occurred within 6 months of training. Only 7 groups involving 12 facilitators have been run. Six of these groups started with 8 or less families, one had 15. Reasons for not implementing the program were workplace related (weight management not in job description, program not supported by management) or personal (maternity leave, left position). Difficulties reported by those who had implemented the program included relevance of program and resources (PowerPoint, parent handbook) to clientele (low literacy, multicultural), retention of families during the 6 month program, high session content. Reasons for families not attending sessions were personal issues, timing and time commitment, travel difficulties. Despite 20–25% of the target age group known to be overweight, recruitment difficulties resulted in low numbers in 6 of 7 groups. This contributed to reluctance of 10/12 facilitators to run the program again and impacted on effective group functioning. A critical mass of families per group is essential. Translational research is needed to develop ways to effectively and efficiently bridge the research-practice gap and improve adoption of evidence-based child weight management.

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73. A STUDY OF THE PREVALENCE AND IMPACT OF PRE-MENSTRUAL SYNDROME ON UNIVERSITY STUDENT LIFE-STYLE BEHAVIOURS AND ACADEMIC PRODUCTIVITY

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Premenstrual Syndrome (PMS) is a relatively prevalent and often disabling condition amongst young women that has the potential to significantly impact on quality of life and individual productivity. The aim of this study was to quantify prevalence, explore and describe the impact of premenstrual symptoms on health related behaviour, academic productivity and activities of daily living (ADL) in university students. A web-based cross-sectional survey was administered via invitation to all female students at Griffith University. The survey was divided in sections collecting information on socio-demographic, lifestyle factors, reproductive history characteristics and experiences with premenstrual symptoms. A total of 1341 students completed the online questionnaire. The estimated prevalence of PMS was 20%. There was a wide range of PMS effects reported by this sample, with up to 20% experiencing frequent negative impacts on university related activities and up to 33% on all ADLs. Around a quarter of the respondents experienced an increase in appetite (27%) and more half reported cravings for 'chocolate or confectionary' (54%). Approximately 20% of the participants reported attempts to manage premenstrual symptoms by undertaking various dietary measures and about a quarter reported undertaking physical activity measures (26%). The present study suggests that PMS is a widespread problem amongst female university students of reproductive age. It also provides an evidence of perceived diminished ability to function, learn, and accomplish university related tasks in addition to reduced health related quality of life.

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504. MEAT CONSUMPTION: A MEAL PERSPECTIVE

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Meat (red meat, poultry, pork) is a nutrient dense food which is consumed in different ways depending on the context of consumption. The meal context is rarely investigated but may have implications on dietary outcomes and recommendations. This paper provides a contemporary insight into meat consumption in Australian households. Information from a wide range of sources was accessed, including food distribution and purchasing data, market research and secondary analyses of the 2007 Australian National Children's Nutrition and Physical Activity Survey (ANCNP). Results from the ANCNP indicate beef and chicken are the most commonly consumed meats (35% and 32% of total intake). Compared to other meats eaten at the evening meal, red meat (beef, veal and lamb) is more likely to be consumed as casseroles or with pasta and less likely in sandwiches. The amount of accompanying vegetables (excluding potatoes) was 159 g for red meat, 110 g for poultry, 107 g for fish and 50 g for pork. Intakes of chips/wedges were highest with fish and chicken (18 g and 15 g, respectively). Girls aged 9–16 years, identified as consuming the highest intakes of red meat and vegetables (a "meat and vegetable" dietary pattern), had higher intakes of fruit, whole grain breads, low fat yoghurt, and lower intakes of take-away foods and soft drinks when compared to other dietary patterns. The meal context provides useful insights into how meat is consumed in Australia, including the type of foods associated with its consumption. These insights may be relevant to the way in which nutritional recommendations are communicated.

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652. ATTRIBUTES OF A SUCCESSFUL GROUP BASED LIFESTYLE MODIFICATION PROGRAM FOR CHRONIC DISEASE MANAGEMENT: THE PERCEPTIONS AND OPINIONS OF GROUP FACILITATORS, GROUP PARTICIPANTS AND THEIR PARTNERS OR SPOUSES

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Diabetes is the fastest growing disease nationally and internationally, with one Australian being diagnosed every 8 minutes. The cost burden of chronic disease is substantial, with type 2 diabetes accounting for the vast majority of these costs due to the sheer number of patients. Group education programs for chronic disease patients offer many potential advantages over individual visits, including cost effectiveness and numerous health benefits. The reasons for the success of group education programs have not yet been explored, with various factors being ignored in the chronic disease group education research to date. Despite a thorough review of the available literature, it is difficult to establish the attributes of successful group based education programs for type 2 diabetes management. The aims of this study were to explore the development of group based chronic disease education programs and identify the impact of program structure, content, and group interactions on the effectiveness of these programs. The study was an exploratory, cross-sectional study utilizing individual interviews with group facilitators, participants, their partners or spouses, using open and closed ended questions. Preliminary results suggest major limitations in the development of evidence-based programs, and a preference for non-didactic programs with a focus on group interactions and group environment, as opposed to the program content and structure. Patient education is the cornerstone of diabetes self-management and is essential in achieving improved outcomes for diabetic patients. There is currently a great need for effective educational interventions for patients with type 2 diabetes.

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110. THE INFLUENCE OF GENERATION ON INCREASES IN DIETARY ENERGY INTAKES OF US ADULTS

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Environmental and economic influences have led to increases in energy consumption of most adults throughout the developed world. National nutrition surveys indicate increases over time, for example, US data shows increases from the first National Nutrition Health and Examination Survey (NHANES) in 1975 to that in 2005/6 (Austin *et al.* 2011). However, different generations experience secular changes at different stages of their life course so that the way a particular environmental change influences them may vary from one birth cohort to another. Younger generations might embrace newer undesirable cuisines more readily than older generations. The aim of this study was to investigate if generation influenced energy intake. An age-period-cohort model (Allman-Farinelli *et al.* 2008) was used to study the effects of the three variables on energy consumption using six NHANES Surveys from 1971 until 2007/8. The reference cohorts were those born 1936 through 1955. For males, birth cohort predicted energy intake showing generational increases for those born from 1896 through 1975 with incremental change as much as 2,400 kJ.

For females, energy intakes showed generational increases for those born from 1896 through 1985 with incremental change as much as 770 kJ. Further investigation to determine what foods and meal patterns vary in the diets of those generations born most recently to those born almost a century ago is warranted and this information should be used to enable changes in food choices, food product formulation and food habits.

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722. DIET QUALITY AND ASSOCIATION WITH NUTRITION KNOWLEDGE, SOCIO ECONOMIC STATUS, AND BMI

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The objective of study was assessing the diet quality and its relation to nutrition knowledge, socio economic status, and body mass index (BMI) among adults. The cross sectional study with 104 people adults aged ≥25 years old from Kedungkandang subdistrict, Malang were involved by multiple sampling. Body Mass Index (BMI) and waist hip circumference was measured and two non consecutive 24-h dietary recall and semi quantitative FFQ were conducted. Nutrition knowledge using structured questionnaire that modified from Parameter and Waldert questionnaire. The nutrition knowledge score of most respondents are low (51%) and SES is middle (56.4%), but ratio waist hip ratio is high 55.8% although BMI status is normal (53.8%). The average of dietary diversity score from diet 1.6 ± 0.2 (max score 4); micronutrient adequacy 0.03 ± 0.2 (max score 11); and prevention score 3 ± 0.9 (max score 6) and total diet quality score was a poor diet (4.63 from max score 21 or 22%). There was no correlation of dietary diversity and micronutrient adequacy and prevention score based on socio economic status (SES), nutrition knowledge status and BMI. There was a positive correlation between nutrition knowledge status with SES and BMI. The conclusion is diet quality was still a poor and so there was no correlation with SES, nutrition knowledge and BMI.

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139. BEHAVIOURAL AND COGNITIVE PROCESSES ADULTS USE TO CHANGE THEIR FRUIT AND VEGETABLE CONSUMPTION

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Inadequate intake of fruit and vegetables accounts for 2.2% of the burden of disease in Australia. To help understand how ready adults are to change intake and what enables them to change, we assessed stages- and processes-of-change. A validated questionnaire that measures stages- and processes-of-change in relation to fruit and vegetable consumption was used to investigate the cognitive and behavioural processes adults use to change intake. University students and workers (n = 105; female = 77) aged 18–60 years and in paid employment for a minimum of 7 hours per week participated. Stage-of-change classification was based on a previously validated algorithm that included a quantitative component to assess fruit and vegetable intake and questions regarding readiness to change. The process-of-change questionnaire used 40 items, with responses on a 5-point Likert scale ranging from 'never' (scored as 1) to 'repeatedly' (scored as 5). Thirty-one were in precontemplation, two in contemplation, 58 in preparation and 14 in maintenance. No participants were classified into the action stage-of-change. ANOVA was used to compare differences in process usage between stages (data from contemplation and preparation were combined). The largest difference in process usage occurred between precontemplation and the combined contemplation/preparation stages, for both cognitive process usage ($p < 0.0005$) and behavioural process usage ($p < 0.05$). The individual processes predominantly responsible for these changes were consciousness raising, dramatic relief, self re-evaluation and self liberation. When designing a program to increase fruit and vegetable intake, targeting these processes may assist participants' progression towards behaviour change.

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645. NUTRIENT CONTENT, CUSTOMER DEMOGRAPHICS AND PURCHASE BEHAVIOURS OF PURCHASES AT TWO MAJOR CAFÉ CHAINS IN AUSTRALIA

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Research describing nutrient content of café purchases and demographics of café customers is limited. We aimed to determine the association between demographic, social and behavioural factors and the nutrient content of purchases at Gloria Jeans and Starbucks café chains. Surveys collecting purchase and demographic information were administered to customers aged ≥16 years, at stores in New South Wales and Queensland. Nutrient content of purchases was estimated using nutrition information from websites and Foodworks™ databases. Linear stepwise regression analysis was used to examine factors associated with purchase nutrient content. Surveys were collected from 1903 customers (66% F; 34 (16–95) years, 91% response rate). Purchases contained 1485 ± 1085 kJ, 9 (0–91) g fat, 6 (0–51) g saturated fat, 282 ± 136 mg calcium, 8 (0–92) g added sugar in beverages, and 20 (0–84) g total sugar in foods. Purchasing food and food extras were associated with increased energy (B = 1784, 169 kJ), fat (B = 21, 3 g), and calcium content of purchases (B = 141, 48 mg) ($p \leq 0.05$). Selecting a blended beverage, full cream milk, the largest drink size, and drink extras were associated with increased energy (B = 169–758 kJ), fat (B = 2–7 g), added sugar (B = 2–25 g) and calcium (B = 23–122 mg) in purchases ($p < 0.05$). Cafe-style purchases were energy dense; the average purchase contributed 17% of an 8700 kJ diet. Purchasing full cream milk, extras (cream, sugar) and large sizes may increase the energy, fat, saturated fat, and sugar content of café purchases; possibly contributing to weight gain. Increased awareness of the nutritional content of café products is recommended among dietitians and customers in order to facilitate healthier purchase behaviours at cafés.

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7.4 Dietary Methodology and Nutritional Assessment

LEAD SESSION: FOOD STANDARDS, DIETARY MODELLING AND PUBLIC HEALTH NUTRITION POLICY

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The use of dietary modelling to inform the development of food Standards sits within a larger Risk Analysis Framework. An essential feature of this Framework is the separation in thinking between Risk Assessment and Risk Management. In Risk Assessment, dietary modelling assists in characterising the risk of the dietary component of exposure to a given food chemical or nutrient intake for a specific population. Risk Management is the process of deciding what, if anything, should be done about the potential risk and analysing what option(s) are available. In Risk Management, the results of Risk Assessment, other information, such as behavioural science and health economic analysis, and policy considerations inform the decision about which option should

be selected. The Framework is then applied to the steps for developing food-based dietary guidelines, an educational tool aimed at the general public, illustrating how the Framework can help make sense of the various streams of information used in the wider public health nutrition arena. Two different types of dietary modelling, one for Risk Assessment and a different process for Risk Management, are required in the development of food-based dietary guidelines.

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159. REPORTING OF DIETARY ASSESSMENT METHODS AND USE OF INFORMATION TECHNOLOGY IN FOOD-BASED RANDOMISED CONTROLLED TRIALS

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The range of randomized controlled trials reported in the scientific literature is extensive. A systematic literature review was conducted with the aim of determining how dietary assessment methods were reported and the use of assisted technologies. OVID (Medline, Pre-Medline, PsychINFO, Cochrane, ERIC and Cynahl) and ScienceDirect databases 2000–2010 were searched for food-based parallel randomized controlled trials in humans. Studies relating to drug testing, vitamin or mineral supplements, enteral or parenteral nutrition and behavioural/educational interventions were excluded. Meal replacement studies were included. A total of 1364 abstracts were reviews and 347 studies identified. Additional articles referred to in the methods as the main publication and not captured in the initial search were also retrieved. Food record methodology was the most common assessment technique with three day duration the most common timeframe (2 week, 1 weekend day). There was a limited use of information technology for the assessment. Technology was primarily reported for analysis of nutrient data. Dietary analysis software used to determine for nutrient intakes is country specific. The end point of the study is the most commonly used time point for dietary assessment. The regular use of food record methodology to measure actual rather than usual dietary intake may not capture foods eaten intermittently though is not as resource heavy for a study. Information technology use may increase in the future allowing automation of dietary analysis and also allowing other forms of assessment to be used efficiently.

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192. CAN MOTHERS ACCURATELY DESCRIBE THEIR TODDLER'S WEIGHT? RESULTS FROM THE NOURISH COHORT

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A mother's perception of her child's weight may be more important in determining how she feeds her child, than the child's actual weight status. Use of controlling feeding practices, prompted by perceptions and concerns about weight, may disrupt the child's innate self-regulation of energy intake. This can promote overeating and overweight (Costanzo & Woody 1985). This study describes mother's perception of her child's weight relative to the child's actual weight. Mothers in the control group of NOURISH (n = 276) were asked to describe their child as underweight, normal weight, or somewhat/very overweight via self-administered questionnaire when children were aged 12–16 months (Daniels *et al.* 2009). Child's weight and length were measured by study staff. At assessment, mean age (sd) was 13.7 (1.3) months, mean weight-for-age z-score (sd) was 0.6 (0.8) (WHO standards; WHO 2008), and 51% were male. Twenty-seven children were perceived as underweight (10%) and twelve children were perceived as overweight (4%). ANOVA revealed significant differences in weight-for-age z-scores across each category of weight perception, mean (sd) –0.2 (0.5), 0.6 (0.8) and 1.8 (0.7) for underweight, normal weight and overweight respectively $F(4, 288) = 15.6$, ($p < 0.00$). Based on WHO criteria only one of the 27 children was correctly perceived as underweight (WHO 2008). Similarly while 12 children were perceived as overweight, 88 were actually overweight/at risk. At group level, children of mothers who perceived their child as underweight were indeed leaner. However at the individual level mothers could not accurately describe their child's weight, tending to over-identify underweight and perceive overweight children as normal weight.

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220. DEVELOPMENT OF A NUTRITIONAL SCREENING METHOD IN INDONESIAN HOSPITALS

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Nutrition screening needs to be done on all patients to improve accuracy of nutrition intervention. The aim of this study was to develop a screening tool that matches with the conditions of patients in Indonesian hospitals. This research was an observational study with cross-sectional design review of 450 adult patients in Sardjito General Hospital Yogyakarta on February–May 2011. Excluding maternity and psychiatric patients. The ability of various nutrition screening questions to predict subjective global assessment (SGA) were examined in contingency tables. From 32 nutrition screening questions, there were 19 questions that have content validity and reliability ($r > 0.308$ and α Cronbach 0.888). Then, 19 nutrition screening questions were tested individually against SGA using the chi-square test. Screening questions that had a high sensitivity, specificity, and associations with SGA were 8 questions and consisted of four component about patient's condition, weight loss, decline in intake, and disease conditions was termed the Indonesian Nutrition Screening Tool (INST). Subjects with score of 4–8 were classified as at risk of malnutrition and subjects with score of 0–3 were classified as not at risk of malnutrition. Patients that were classified as at risk of malnutrition by SGA and INST were 211 (46.9%) and 219 (48.7%) and were classified not at risk of malnutrition were 239 (53.1%) and 231 (51.3%). INST had association with SGA ($p = 0.000$). Sensitivity and specificity INST with SGA were 86.26 and 84.52.

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114. VISCERAL FAT AREA CUT-OFF FOR THE DETECTION OF MULTIPLE RISK FACTORS OF METABOLIC SYNDROME IN JAPANESE: THE HITACHI HEALTH STUDY

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The relationships between metabolic risk factors and abdominal fat distribution determined using computed tomography (CT) are poorly

defined in large populations. We investigated the cut off values of the visceral fat area (VFA) to detect subjects with multiple risk factors of metabolic syndrome (MS) by sex and age groups, and attempted to examine whether sex- and age-specific cut-off values are needed. The subjects of this study were 11,561 Japanese men and women who participated in the Hitachi Health Study, received CT examination, and answered questionnaires on lifestyles between 2004 and 2009. VFA and waist circumference were measured using CT. The VFA cut off values yielding an 80% sensitivity for the detection of multiple risk factors of MS were typically smaller among subjects under the age of 40 years (<40 years vs ≥40 years; 86.4 cm^2 vs 103.9 cm^2 for men and 36.5 cm^2 vs 69.2 cm^2 for women). The area under the ROC curve of VFA for the detection tended to decrease according to age ($P = 0.056$ and $P = 0.020$ for trends in men and women). Age- and sex-specific cut off values are needed. The sensitivity of the subjects under the age of 40 years is relatively smaller (70.0% for men and 60.0% for women) compare to other age groups when the same cut off value is used regardless of age (e.g. cut off value calculated to correspond to 80% sensitivity for subjects of all ages). Therefore, a smaller VFA cut off point should be used among those under the age of 40 years.

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7.5 Dietetics Practicum

948. OUTCOMES ASSESSMENT OF AN ADVANCED PRACTICE ONLINE MASTER OF SCIENCE (MS) IN CLINICAL NUTRITION PROGRAM FOR REGISTERED DIETITIANS

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The primary aim of this educational outcomes study was to assess alumni perceptions of achievement of program competencies of an online advanced practice MS in Clinical Nutrition program (MSCN). Programmatic competencies address advanced education, knowledge, research and role expansion. Of the 94 MSCN alumni who were sent an electronic survey in August 2011, 55.3% (n = 52) responded. The respondents were 83.0% (n = 39) white and 95.8% (n = 46) female with a mean of 12.98 ± 6.84 years credentialed as an Registered Dietitian (RD) working primarily in clinical nutrition practice (n = 27, 55.1%). Respondents expressed that earning their advanced MS degree led to an increase in salary/compensation (n = 11, 22.0%), career promotion (n = 8, 16.0%), and/or a change in job position (n = 19, 38.0%). Respondents reported increased involvement in research activities as principal investigators (n = 7, 14.6%) and as co-investigators (n = 17, 35.4%). Thirty-two percent (n = 16) of respondents have published manuscripts in peer-reviewed journals; 22.4% (n = 11) have authored book chapters or professional newsletters, and 40.0% (n = 20) have presented poster sessions at the national or international level. Fourteen percent (n = 7) have earned professional awards and honors and 19.1% (n = 9) have served in leadership roles within the dietetics profession. Findings from this alumni survey suggest that an online advanced MS degree does position graduates for career expansion, leadership roles, and scholarly activities; characteristics imperative for the RD practicing in the 21st century.

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965. LEADERSHIP AND EVIDENCE IN PROVIDING STUDENT DIETITIAN CLINICAL PRACTICE PLACEMENTS

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Within a large multi site health network, balancing clinical learning objectives with what each placement site can offer as practical experience can be a challenging task. The aim of this survey was to determine the optimal rotation during dietetic clinical placement, matching learning objectives, placement site opportunities and clinical educator caseloads. A survey was developed and distributed to 32 clinical dietetic educators within one health service, examining their perception of the clinical conditions and caseload variety they could offer students. 28 dietitians completed the questionnaire (response rate 88%). Respondents indicated different learning opportunities are emphasised across the continuum of care. Interpretation of results from surveyed clinical educators suggests that experiences within each clinical area should be scheduled with specific training purposes in mind. Clinical educators thought that the sub-acute setting provided the most suitable base for starting clinical placements, with more exposure to core conditions of diabetes mellitus, cardiovascular disease and oral nutrition support, and the slower patient turnover allows for refinement of assessment skills. Final year placements require students to become competent in dietetic assessment, diagnosis/intervention, education, monitoring and evaluation, discharge planning and workload management. Therefore, later clinical placements should rotate students through all settings, emphasising each skill in turn (such as enteral feeding at acute sites and group education at subacute sites), finishing with a workload providing graduate level experience. In summary, a skill-based placement model may provide an enhanced learning experience for both students and educators and therefore warrants further investigation.

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968. RESEARCHING OUR PROFESSION: THE WORKING PROFILE OF PRIVATE PRACTICE DIETITIANS IN AUSTRALIA

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Accredited Practising Dietitians who work in the private sector or 'private practice', represent an increasing proportion of Australian allied health professionals. The aim of this study was to describe the demographic, operational and financial working profile of private practice dietitians in Australia. An online survey was distributed amongst members of the Dietitians in the Private Sector Interest Group (DIPSIG) list serve, hosted by the Dietitians Association of Australia (DAA). A total of 156 dietitians (of an estimated 1,222 list serve members) completed the online survey between September and October 2011. Nearly all respondents were female and aged in their 20–30 s. The majority of Dietitians (74%) identified themselves as being the proprietor of the business in which they worked; and most (84%) had previously worked in other areas of dietetic practice. Most dietitians (69%) conducted less than 20 consultations per week; with the main source of referrals being General Practitioners. The average length of an initial consultation was 52 minutes; with the average fee charged being $99. Review consultations were on average 28 minutes, incurring a fee of $66. Reported gross income was variable; with a similar proportion of respondents reporting incomes of less than $30,000 per year, $30,000–$60,000 per year and greater than $60,000 per year. Of those who were remunerated on a 'percentage of income generated' basis, the average rate was 52% (± 3%). The working profile of Private Practice Dietitians in Australia will assist DAA in providing informed support and advocacy for Dietitians working in the private sector.

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623. POTENTIAL POSITIVE IMPACT OF AN EXCHANGE PROGRAM

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This presentation advocates the importance of creating exchange programs among universities worldwide to enable dietetic educators and students to better communicate and learn about their programs. Such opportunities will enhance communication and language skills of the non-English speaking participants, promote learning about different cultures and ethnicities and introduce them to multicultural teaching early in their careers – a priceless experience for all. At Wayo Women's University, a trial program on Basic Nutrition in English taught to senior nutrition students allowed them to integrate their newly-learned English language skills with their professional nutrition knowledge. This program led to a linkage with Brescia University College and forged a relationship between the two universities through an exchange program. In this planned program, Japanese students will further develop their English language ability and participate in Brescia's nutrition and dietetics program while the Canadian students will attend Wayo to participate in community outreach and research programs and peer student teaching in English. The need for better communication and professional exchanges among dietetic educators and students around the world could be met through bridging programs and international exchanges. Such educational programs could serve as venues for more and better internationalization, networking and leadership opportunities for all participants from the partnering institutions. Details of the exchange program will be presented.

416. USE OF A DATABASE APPROACH IN GUIDING QUALITY ASSURANCE AND IMPROVEMENT ACTIVITIES TO ENHANCE STUDENT LEARNING IN NUTRITION AND DIETETICS EDUCATION

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The 3P (Presage, Process, Product) Model of Student Learning (Prosser & Trigwell, 1999) has been used extensively in researching student learning in higher education. Using this model and a database approach, the aim of this project was to determine parameters that are important to consider when planning and implementing quality assurance (QA) and quality improvement (QI) activities specific to nutrition and dietetics education. Quantitative and qualitative data from course and teaching evaluations, and other means of student and teacher feedback, were imported into a Discipline-developed database. Data was sorted, transcribed, and interpreted to determine key action areas for QA and QI. The Presage and Process entities of the Model were used to guide the analysis. The following areas were identified as important in the consideration of QA and QI activities: (1) Student characteristics: undergraduate/postgraduate, local/international, language skills, previous knowledge. (2) Course context: coordination, course content, learning outcomes, association with professional body competencies, course readings, timetabling, lectures, tutorial/workshop/practical sessions, learning activities, assessment, impact of other units of study. (3) Motivation and conceptions: type and source of motivation, relevance of course/topic. (4) Perceptions of environment: coordination, teaching staff, teacher traits/attributes, teaching quality, workload, assessment, resources, audiovisual aids. In conclusion, QA and QI activities can be actively pursued through the consideration of several variables supported by the 3P Model. Further development of this database tool will allow QA and QI activities to be recorded and monitored, and outcomes on student learning explored.

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178. REFORM WITHIN DIETETIC INTERNSHIP TRAINING

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In Israel, practical dietetic training (internship) is mandatory, and its completion a precondition for the dietitians licensing examination. The training (content, placements) is the Ministry of Health's responsibility, and is carried out in diverse health care settings. Internship eligibility includes a first degree in nutrition. Dietetics student numbers have grown (210 in 2010), with insufficient places (160) available for internship training, and some of those eligible forced to wait up to 2 years for placement. This is not just an Israeli problem. Students in the USA face similar problems (ADA times, Feb 2010 – estimates that since 1994, as many as 27,000 graduates of dietetic programs have not secured internships). To clear the bottleneck, and avoid recurrence, the Ministry revised the internship model, to allow for three groups annually (formerly two). The new internship training is divided as follows; 14 weeks – general hospital, 3 weeks – community clinic, 2 weeks – large catering institution, 3–4 weeks – public health, and 3–4 weeks – long-term care institution, this being a total of 26 weeks, 750 hours. The change also provides broader training and formalizes inclusion of food service training. It will be effective from October 2011. This Israeli creative solution to a problem, which exists also elsewhere, could serve as a model for others, facing the increasing demand for internship programs and placements.

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1021. DIETETIC CONFIDENCE WORKING WITH CLIENTS WITH DEPRESSION/ANXIETY IS ASSOCIATED WITH CLIENT-FOCUSED PRACTICE AND ADVOCACY SKILLS

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Queensland University of Technology, Australia

Confidence in a professional role is a key element in the successful transition to competent practice. New graduate dietitians report that whilst they are confident about their general dietetic ability, they are not as confident when working with clients experiencing depression or anxiety. This study aimed to develop and validate a scale which measured confidence about working with clients with depression/anxiety. The 21-item Dietetic Collaborative Practice Scale was developed using research about dietetic practice in mental health (Dowding *et al.*, 2011), coping self-efficacy literature (Chesney *et al.*, 2006) and collaboration with industry experts. A convenience sample of 189 Australian dietitians completed the questionnaire. Exploratory factor analysis suggests that dietetic confidence is best represented by a two-dimensional solution consisting of (a) Client-focused practice (CFP, 50.8% variance); and (b) Advocacy for self and client care (ASC, 9.7% variance). The alpha coefficient of both dimensions (CFP $\alpha = 0.95$, ASC $\alpha = 0.84$) demonstrates the internal consistency of components. Combined, these two components account for 60.5% of variance. The scale components were not related to years of practice or working with mental health clients but were significantly related to overall dietetic confidence (ODC). Correlation coefficients between ODC and CFP were 0.501 ($p < 0.01$), ODC and ASC were correlated at 0.465 ($p < 0.01$) and CFP and number of years as a dietitian were weakly correlated at 0.24 ($p < 0.05$). Results have implications for dietetic training and professional development. Client focus and advocacy for self and client appear to be important factors in overall confidence as a dietitian.

Funding source: Australian Postgraduate Award, QUT Institute of Health and Biomedical Innovation, Queensland Government Smart Futures Scholarship

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7.6 Aged Care
LEAD SESSION: NUTRITION AND DIETETICS IN AGED CARE

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The global trends of rapid population aging and increased risk of malnutrition among older people have a tremendous impact on nutrition care for the elderly. It is a great challenge and opportunity for dietitians to identify and monitor the nutrition needs and malnutrition problems of the elderly, to improve the quality of food services in health care facilities, and to initiate innovative approaches to nutrition and dietetic services in the community.

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412. OBSERVATION OF LUNCH MEAL EXPERIENCE ON AN ACUTE HOSPITAL WARD

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The prevalence of malnutrition in an Oncology ward was 72%. Protected mealtimes are an initiative that addresses barriers to meal access that may contribute to malnutrition. We aimed to describe the current mealtime environment, to identify barriers to meal access and develop specific local strategies to improve the mealtime experience. Redesign methodology including observation, process mapping, and root cause analysis was used to determine specific local barriers to food access. Service of 32 lunches was observed. Twenty-two percent of meal trays were out of reach; 80% of bed-side tables were too cluttered for meal delivery; 37% of patient lunches were interrupted by menu monitors. It was unclear whose role it was to position patients and tables for meals, and to ensure there was room for placement of meal trays. Menu monitor interruptions were due to a change in workflow with a new electronic meal ordering system. Interventions included modification of menu monitor workflow; two-hourly nursing rounds to address patient position and proximity, and inclusion of meal-time set up and assistance in job descriptions of Health Assistant Nurses. Evaluation of the impact of these changes is currently underway and results will be reported.

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272. TREATING MALNUTRITION IN HOSPITALS – THE ROLE OF FOOD TO IMPROVE INTAKE

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Malnutrition is recognised as a common problem in Australian hospitals, especially for oncology patients. PeterMac is Australia's only dedicated cancer hospital; over 65% of in-patients are identified as at-risk of or with malnutrition, following screening on admission. With the increased detection of malnourished patients, the treatment focus must turn to food and menu planning. This challenges hospitals to ensure that food provided is appetising and adequate to meet patient's nutritional needs. The aim of this research is to examine food consumption and strategies for improving food intake. Food consumption and adequacy of oral intake was determined by assessing plate wastage from main meals and supplements (ONS) served to inpatients. Plate wastage was assessed using a validated visual estimation method of digital photography pre and post meal trays. Wastage data was used to estimate daily intake for energy and protein by difference. On 3 consecutive days, 679 patient's meals were audited over all 3 meal periods. We found that while 75% of patients eat all their breakfast, 40% did not complete all their lunch and evening meal. ONS were offered to 56% of patients, 30% of which were not consumed. The estimated daily intake from 3 meals and ONS from 226 patients was an average of 4.5 MJ ± 0.3 MJ and 67 g ± 4.4 g protein. Food wastage data can be used to provide a snapshot of hospitalised patient's nutritional intake. This provides vital information to be used in improving menu item acceptability, increasing hospital food intake and therefore address malnutrition.

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354. DOES ACCESS TO SMALL DELICIOUS DISHES, 24 HOURS A DAY, HAVE A POSITIVE EFFECT ON NUTRITIONAL INTAKE IN PATIENTS AT NUTRITIONAL RISK?

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The aim of this study was to investigate if a new energy dense food concept, on order 24 hours a day, would lead to an adequate nutritional intake in patients at nutritional risk. A historically controlled intervention study of 40 patients at nutritional risk, according to the NRS-2002 criteria was conducted. The food concept consisted of 36 small delicious dishes. We found no difference between the two groups in overall energy and protein intake but a significant increase ($p = 0.0005$) in energy intake was seen over time in the intervention group. The result was statistically adjusted for BMI, age and screening scores. Patients primarily ordered food in the daytime. We found no significant difference in overall energy intake between the two groups but a significant increase ($p = 0.0005$) in energy intake was seen over time in the intervention group. It is commonly known that implementation of new routines takes time. If a new food concept is to be tested in a clinical trial, we recommend an induction period of 4–6 weeks, before initiation of the trial. Moreover, a 24 hour a la carte service appears unnecessary.

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267. PRACTICALITIES OF MENU-BASED CHANGES TO IMPROVE DAIRY CALCIUM INTAKE IN AMBULATORY AGED CARE RESIDENTS

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Low dietary calcium intakes (<600 mg/day) are common in low-level aged care residents and contribute to fracture risk. Limited data is available describing menu-based changes to improve dietary calcium intake and none have been comprehensively evaluated. We aimed to increase dietary calcium intake in residents to recommended levels (1300 mg/day) via the food service by including 2 additional serves of dairy foods per day to the menu. Dietary intake was assessed using 3-day food intake records in 64 low-level aged care residents (mean age 89 years, 75% females) from two facilities over 6 days throughout 4-week menu cycles before, and after menu-modifications were commenced (12 days total). In consultation with food service staff, menu changes were made, consisting of recipe modifications, adding dairy foods to existing meals, substituting items for dairy foods or using dairy-based accompaniments to meals. Existing food ordering methods were used. Mean baseline dietary calcium intake was 550 ± 187 mg/day. During the supplementation period, mean calcium intake increased to 646 ± 290 mg/day ($p < 0.01$) During the intervention period calcium intake improved over time, with a higher intake observed in the 4th week relative to the first week (860 ± 386 mg/day v 627 ± 344 mg/day, $p < 0.01$). Improvements in dairy calcium intake can be achieved through menu modifications however the aim of 2 additional serves of dairy was not obtained. Barriers included time constraints and reluctance to alter menus by food service staff. A more intensive intervention involving additional food

service support is required and will be initiated to achieve the desired outcome of dietary calcium intakes at recommended levels.

Funding source: Dairy Australia

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397. RELATIONSHIP OF QUANTITATIVE ULTRASOUND OF THE CALCANEUS WITH SOCIO-DEMOGRAPHIC FACTORS AND ANTHROPOMETRIC INDICATORS AMONG MALAYSIAN ELDERLY

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Osteoporosis is a public health problem worldwide, leading to bone fractures, disability and a burden to the health care system. The quantitative ultrasound (QUS) can be a useful, safe and inexpensive diagnostic technique for early detection of osteoporosis among free-living elderly population. The purpose of this paper is to determine the relationship between bone health status with socio-demographic and selected anthropometric variables among 980 (Males = 40.7%; Females = 50.3%) non-institutionalised elderly. Bone Health Status was assessed using Quantitative Ultrasound Sonometry (QUS-2). Selected anthropometric indicators were measured using appropriate equipment and standard procedures. Socio-demographic background and lifestyle were assessed using appropriate instruments. Data were analysed using SPSS software version 18.0. The mean Broadband Ultrasound Attenuation (BUA) was 71.4 ± 20.6 dB/MHz and the mean T-score was –1.42 ± 1.66. The BUA values were significantly higher in males, from urban areas, younger age categories and with higher body mass index (BMI). About 27% were classified as osteoporotic and 34.7% were osteopenic. BUA was negatively correlated with age ($r = -0.167$; $p = 0.000$) while the correlations were positive with body weight ($r = 0.263$, $p = 0.000$), height ($r = 0.196$; $p = 0.000$), BMI ($r = 0.183$; $p = 0.000$), fat-free mass ($r = 0.293$, $p = 0.000$) and skeletal muscle mass ($r = 0.290$; $p = 0.000$). In summary, osteoporosis or low bone mass exists among Malaysian elderly, especially among the females, those in the rural areas and the older age groups. A number of factors may contribute to increased risk of osteoporosis. Therefore, it is important to create awareness and formulate preventive as well as therapeutic strategies to delay and treat the loss of bone mass among the aging population.

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7.7 Research Designs and Tools 2
LEAD SESSION: NUTRITION RESEARCH IN THE AREA OF CV NUTRITION

PENNY KRIS-ETHERTON
Abstract not received for publication

122. MIXED METHODS IN PRACTICE: INTEGRATING A RANDOMIZED CONTROLLED TRIAL, EMBEDDED NUTRITIONAL STUDY AND SEQUENTIAL QUALITATIVE CASES

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Mixed methods combines a philosophy, methods and a research design orientation where the researcher rigorously analyses both qualitative and quantitative data either integrating both forms of data concurrently, embedding one within the other or sequentially building on the other during multiple phases or within a single study. The aim of this multi-phased dietary intervention was to determine the clinical and social drivers of the iron status of young women. This study will be used to demonstrate mixed methods integration and the power of this methodology to extract breadth and depth of nutritional data without losing the voices of the participants and the complexity of the clinical findings. Data are viewed from multiple viewpoints and the amalgamation of both quantitative and qualitative approaches to data collection and analyses has been innovatively addressed together with advances in computer software enabling the asking of new questions, exploration of any clusters and the development of predictive models. Using mixed methods for this study provided dietary and clinical data from the randomized controlled trial and facilitated judgements on dietary guideline attainment, guideline interpretation, meal patterning, a predictive model of eating, intra- and inter-generational changes as influences guiding food intakes and the intensity of each of these stimuli on consumption patterns. Mixed methods is a research modality well-matched to nutrition research because nutrition is multifaceted having clinical, public health and behavioural components too often isolated from each other because of the limitations of the traditional research archetypes.

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941. NECK CIRCUMFERENCE AND IT'S RELATION TO BLOOD LIPID PROFILES OF SHIFT WORKERS IN TURKEY

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Shift work is frequently associated with cardiovascular disease (CVD). Neck circumference is an important anthropometric measure that may provide information for CVD risk factors. A cross sectional study was carried out in 336 shift worker men in order to determine neck circumference and relation between blood lipid profiles. We use a questionnaire to determine the nutritional behaviours of participants and 24 h dietary recall was taken by a dietitian. Blood lipid profile (LDL-cholesterol, HDL-cholesterol, triglycerides) were tested and health examination including anthropometric and blood pressure measurements were assessed. According the neck circumference 70.5% workers had CVD risk factors. Participants total cholesterol, LDL, and triglyceride level was high, 23.8%, 44.9%, 8.9% and 14.3% respectively when we compare the blood lipid profiles with AHA recommendation. We found a statistical significance between neck circumference and total blood cholesterol ($p < 0.01$), HDL cholesterol ($p < 0.05$), LDL cholesterol ($p < 0.01$) and blood triglyceride ($p < 0.01$) levels. Neck circumference had a correlation with total cholesterol, HDL cholesterol, LDL cholesterol, triglyceride levels, and also diastolic blood pressure ($p < 0.01$). Our data show that neck circumference is a simple and non-invasive method to use in the evaluation of metabolic risk factor of CVD.

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995. DOES THE MNA-SF PREDICT CLINICAL OUTCOMES AT 6 MONTHS IN OLDER REHABILITATION PATIENTS?

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The aim of the study was to determine if nutritional status as assessed by the revised Mini Nutritional Assessment – Short Form is predictive

of relevant clinical outcomes within six months in older rehabilitation patients and to investigate the relationship between diagnosis and nutritional status. A consecutive retrospective case note audit of 181 patients ≥65 years who were admitted to rehabilitation between May and November 2010 at the Repatriation General Hospital, Adelaide was conducted. Nutritional status was assessed using the revised Mini Nutritional Assessment – Short Form. Outcomes measured included length of stay in rehabilitation, complications during admission, participation in rehabilitation activities and change in function during admission. Acute readmissions and mortality were assessed at six months post discharge from rehabilitation. It was found that thirty-nine (22%) patients had normal nutritional status, 98 (54%) were at risk of malnutrition and 43 (24%) were malnourished. Patients at risk of malnutrition/malnourished had longer length of stay (P = 0.008) and were more likely to be poor participators in rehabilitation activities (P = 0.006). Malnourished patients had poor function on admission to rehabilitation (P < 0.001) and had the greatest change in function during the rehabilitation admission (P = 0.012). Patients admitted with functional decline were more likely to be classified as malnourished compared to orthopaedic and neurological groups (P = 0.045). In conclusion over three quarters of older rehabilitation patients were identified as malnourished or at risk of malnutrition and this was associated with poorer function on admission, increased length of stay and poor participation in rehabilitation activities.

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946. OPPORTUNISTIC VS RANDOM SAMPLING FOR MEASURING POPULATION SALT INTAKE

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The gold standard method for measuring population salt intake is based upon a 24 hour urine collection. However, because participant burden is high, randomly selected community samples typically have low response rates with only about one in four agreeing to provide specimens. At this low level of response it is possible that simply asking for volunteers would produce the same results. We randomly selected 2152 adults from Lithgow, New South Wales and obtained usable 24 hour urine samples from 306 of those identified (response rate 16%). We collected specimens from a further 120 volunteers recruited at a local shopping centre. The characteristics of the 'random' and 'volunteer' samples were different – percent women: 53% vs. 62%, mean age: 58 years vs. 49 years and mean BMI: 29.1 kg/m^2 vs. 29.8 kg/m^2 respectively. Overall mean 24 hour urinary salt excretion was 9.0 g/day ($_{SD}$3.3) in the random sample vs. 8.6 g/day ($_{SD}$3.4) in the volunteers. Estimates for men (10.4 g/day vs. 9.6 g/day) and women (7.5 g/day vs. 7.9 g/day) were also similar across samples. These findings suggest that a volunteer sample may provide similar data to a random sample with a poor response rate. While we cannot be sure that either is a true representation of salt consumption in Lithgow, both sets of results are close to those obtained in other Australian surveys of salt consumption.

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7.8 Clinical Nutrition

840. MORTALITY BASED HEALTHY WEIGHT RANGE FOR OLDER ADULTS

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Malnutrition in older adults has a significant negative effect on health outcomes but there is no evidence based healthy weight range, based on mortality for this group. The WHO classification of a healthy weight as a body mass index (BMI) between 18.5 and 24.9 is based on studies of young to middle-aged adults and applicability to older adults is questionable. We performed a meta-analysis to determine the BMI range associated with lowest mortality risk in older adults (≥ 65 years). A search of available databases, including MEDLINE, EMBASE and CINAHL, was performed independently by two of the investigators. Studies were included if they reported the hazards ratio (HR) of all cause mortality for community based adults from predominantly Caucasian populations aged 65 years and over. Of the 989 studies identified, 21 met the inclusion criteria, including 113,745 individuals with an average follow-up of 9.3 years. Using a BMI of 22–25 as the reference range, a BMI less than 22 was associated with a significant increase in mortality risk, with a RR of 1.19 (95% CI 1.12–1.27) at a BMI between 18.5 and 21.9. A BMI between 25 and 30 was associated with the lowest mortality risk, 0.89 (0.86–0.93). Further investigation is required to identify whether higher BMI values are associated with increased morbidity, however this analysis provides strong evidence that older adults should maintain a BMI above 22 and there is no need to advocate weight loss in those with a BMI up to 30 to reduce mortality.

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870. POSSIBLE ROLE OF POORLY ABSORBED SHORT CHAIN CARBOHYDRATES (FODMAPS) IN THE GENESIS OF COLIC IN INFANTS

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Infantile colic is the most common complaint for which parents seek professional advice during the first year of life and occurs equally in breast-fed and formulae-fed infants. Our research team has shown that poorly absorbed short chain carbohydrates – FODMAPs (Fermentable Oligo- Di- and Mono-saccharides and Polyols) can induce wind, bloating and abdominal pain in adults with irritable bowel syndrome (IBS). Nursing mothers with colicky infants contacted our department after successfully trialling our low FODMAP diet for controlling adult IBS. The aim was to explore the potential role of FODMAPs in the genesis of symptoms associated with infantile colic. Three small studies were undertaken. FODMAPs were quantified in (1) 13 infant formulae; and (2) ten common 'gas forming foods' that nursing-mothers often avoid while breast-feeding. Also (3) a pilot study of five breast-fed infants with colic was undertaken whereby the nursing mother was supplied with a low FODMAP diet for seven days. FODMAPs were detected in a number of formulae and gas forming foods (e.g. onions, garlic, and legumes). Also, the pilot study of five breastfed infants found that the mean crying duration reduced from 207 ± 32 min (Pre-diet) to 141 ± 34 min after the mothers consumed a low FODMAP diet for seven days, representing a mean reduction in daily crying duration of 66 min or 35% (P = 0.001). Crying duration decreased in all infants. The results from this preliminary work suggest a role of FODMAPs in infantile colic but this area requires further study.

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827. SELF-DIAGNOSIS OF NON-COELIAC GLUTEN INTOLERANCE BY AUSTRALIAN ADULTS: FAILURE TO EXCLUDE COELIAC DISEASE OR BENEFIT FROM A GLUTEN-FREE DIET

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The existence of non-coeliac gluten intolerance (NCGI), defined as those without coeliac disease but whose gastrointestinal symptoms improve on a gluten-free diet (GFD) has been recently confirmed (Biesiekierski *et al.*, 2011). However, the widespread prescription of a GFD for gut and other symptoms may lead to the under diagnosis of coeliac disease. This study aimed to characterise patients who believed they have NCGI. Respondents to advertising for adults who believed they had NCGI were asked to fill out a questionnaire about symptoms, diet and coeliac disease investigation. Of 233 respondents, 132 completed the survey. Mean age 40 years (range 7–84) and women predominated (8:1). 23% met the description of NCGI. The remaining did not due to inadequate exclusion of coeliac disease (73%), and/or uncontrolled symptoms despite gluten restriction (27%), and/or were not following a GFD (29%). The GFD was self-initiated in 45% or prescribed by alternative health professionals (22%), general practitioners (14%) and dietitians (19%). No investigations for coeliac disease whatsoever had been performed in 14%. Of the 63 (48%) participants who had duodenal biopsies, 35% (22 of 63) had an inadequate gluten intake at the time of endoscopy. In conclusion, the practice of initiation of a GFD without adequate exclusion of coeliac disease is alarmingly common and the belief by 1 in 4 individuals that they are gluten-intolerant despite uncontrolled symptoms seems illogical, but most patients appear to be well versed in the GFD. Education is needed so that exclusion of coeliac disease is better appreciated and patients are investigated definitively.

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579. ONE SIZE FITS ALL? PRACTICE QUESTIONS ARISING FROM A RECENT SCREENING AND ASSESSMENT AUDIT

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The Malnutrition Screening Tool (MST) is becoming well established as the primary tool for malnutrition screening across Australian healthcare facilities. Analysis of several small datasets suggested that in the acute setting, reliance on the MST as a sole predictor of malnutrition may lead to an under-diagnosis of malnutrition. An annual hospital nutrition audit provided data for review (n = 395). MST screening was undertaken by nursing staff as part of routine care. A marketing campaign targeted successful MST completion prior to the audit. Nutrition assessment targeted all patients using the Subjective Global Assessment (SGA) by trained dietitians. Standardisation for inter-rater error was conducted for 90% of dietitians. Malnutrition was classified as SGA-B (suspected/moderately malnourished) or C (obvious/severely malnourished). Mean age was 68 years (SD 18). Screening and assessment completion rates were 72% and 90%. Reported hospital wide malnutrition was 38% with 3% severe malnutrition. For completed screens, MST sensitivity was 47% and specificity was 90%, with positive and negative predictive values of 78% and 68% respectively. There is no gold standard for nutrition screening. The MST is widely used in Australia for screening purposes, and has been validated for use in hospital settings. Accurate nutrition screening is vital to articulate and address the epidemic of hospital based malnutrition, and to recoup increased costs associated with managing malnourished patients. This data clearly indicates the need for further investigation.

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534. IMPACT OF DRY MOUTH ON DIETARY INTAKE IN PLHIV IN AUSTRALIA

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Dry mouth occurs more frequently in People living with HIV (PLHIV) than in the general population. It affects eating and results in food accumulation in the mouth promoting tooth decay and periodontal disease. This study aimed to investigate the impact of dry mouth on dietary intake in PLHIV. A convenience sample of PLHIV attending clinics in Sydney for routine HIV care completed a single question "*Do you frequently have a dry mouth? Yes/No*" and the Oral Health Impact Profile-14 (OHIP14). Five questions relating to diet or may impact diet in the OHIP-14 were analysed. Of the 100 PLHIV, predominantly male (93.4%) participants; 38 reported dry mouth (DM) and were allocated to the "DM" group (mean age 50.2 years) and 62 were classified as "no DM" (mean age 44.4 years). Comparison of the impact of dry mouth between these two groups showed that the DM group reported a significantly less satisfactory diet and more interrupted meals than the non DM group ($p < 0.01$; $p < 0.019$ respectively). Pain was significantly higher in the DM group ($p = 0.011$). Discomfort when eating only showed a trend in this direction but not significant. Proportion of subjects reporting DM with altered taste sensation (13.2%) was higher than the comparator (3.2%) but was not significant ($p = 0.071$). The importance of incorporating a question on dry mouth in nutrition screening for routine HIV care is highlighted by the negative impact on diet demonstrated in this study. Further research is required to determine the impact of dry mouth on nutrient intake.

500. NON-ADHERENCE TO DIET AND EXERCISE IN TYPE 2 DIABETIC PATIENTS IN KATHMANDU MEDICAL COLLEGE TEACHING HOSPITAL

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Non-adherence to therapeutic lifestyle recommendations (diet and exercise) among patients with diabetes is special challenge in their management. This study aimed to measure the proportion of non-adherence and its factors affecting to lifestyle modification (diet and exercise) among a group of Nepalese type 2 diabetic patients. An analytical cross-sectional study design of 385 type 2 diabetes patients (>20 years) were taken with systemic random sampling. A total number of 385 type 2 diabetes patients were selected as our study population with mean (SD) age 54.4 (11.5). Among them maximum (87.5%) were non-adherent to dietary advice and 12.5% were partially adhered. 42.1% of the respondents were non-adherent, 36.6% were partially adhered while only 21.3% had good adherence to physical activity. The mean level of adherence to dietary advice differed significantly between female and male (27% Vs 37%, $p = 0.001$). Adherence level of dietary advice was higher who were advised by physician than others ($p = 0.001$), duration of diabetes ($p = 0.01$), types of family (0.001), distance form hospital (0.013), age (0.06) and knowledge level ($R^2 = -0.013$, $p = 0.024$). Similarly physical activity adherence level differed according to family history (0.001), marital status (0.021), area of residence (0.004), socioeconomic status (0.047), and types of family (0.041). This study showed that adherence of respondents was

lower than needed. Diabetes education and Sociodemographic factors need to be considered to improve adherence to lifestyle modifications.

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129. RETHINKING THE EVIDENCE FOR VITAMIN B6 SUPPLEMENTATION IN HAEMODIALYSIS PATIENTS

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Vitamin B_6 is a water soluble vitamin, important for the normal functioning of multiple organ systems. In patients receiving haemodialysis, vitamin B_6 deficiency has been reported. The impact of ongoing advances in renal medicine on vitamin B_6 status has not been evaluated. The aims of this systematic review were to determine the current level of vitamin B_6 deficiency in the haemodialysis population; to determine the effect of current haemodialysis prescriptions on vitamin B_6 levels; to consider the impact of recent medical advances in haemodialysis on vitamin B_6 levels. Electronic databases were used to locate studies with biochemical measures of vitamin B_6 in the haemodialysis population between the years 2000 and 2010. Inclusion exclusion criteria were applied by two independent reviewers. Of 316 articles identified, 53 were selected for detailed review. Appropriate vitamin B_6 measures and information was extracted. Eleven final studies were included. Vitamin B_6 deficiency was shown to be between 24–56%. Dialysis reduced plasma levels by 28–48% depending on the dialyser used. Advances in renal medicine including the use of erythropoietin stimulating agents and ion exchange phosphate binding resins were shown to negatively affect vitamin B_6 status. Current recommendations for supplementation range from 10–50 mg/day. These figures are based on older studies often with small numbers of patients. Further research is required to make a clear practice recommendation regarding vitamin B6 supplementation and should include analysis of losses in the dialysate using different membrane technologies, consider length of time patients are on dialysis and provide updated dietary intake data.

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377. THE BMI; USE IT AS A BASIC MALNUTRITION INDICATOR OR FILE IT IN THE HOSPITAL CLOSET?

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Body Mass Index (BMI) has been recognised as a useful indicator of nutritional status according to the ICD10-AM definition of malnutrition. Low BMI is associated with increased inpatient complications, morbidity, and mortality. This study aimed to investigate the role of the BMI in predicting the nutritional status of patients in rehabilitation and sub-acute wards in an acute care facility. An annual hospital nutrition audit provided data for review (n = 89; mean age 82; SD 11.7). Calculated heights were obtained using ulna measurements and weights measured using hospital scales. The Malnutrition Screening Tool (MST) was applied by trained nursing staff. Malnutrition risk was determined as BMI < 22 kg/m^2 or MST ≥ 2. Nutrition assessment was conducted using the Subjective Global Assessment (SGA) by trained dietitians. Malnutrition was classified using SGA-B (suspected/moderately malnourished) or C (severely malnourished). Malnutrition prevalence was 50% (45% moderately malnourished, 5% severely malnourished). BMI screening completion rate was high at 91% with sensitivity 73% and specificity 75%. MST screening had 74% completion with sensitivity of 29% and specificity of 91%. Limitations of the BMI include reliance on accurate height and weight data, and lack of differentiation between muscle fat and fluid. The BMI also fails to identify malnutrition in normal or overweight patients. In elderly populations with endemic delirium, dementia and chronic malnutrition, single parameter indicators of nutritional status such as the BMI may support current methods of nutrition screening that are reliant on patient responses. Filing the BMI in the hospital closet might just hide more skeletons.

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CONFERENCE DAY 3
FRIDAY 7 SEPTEMBER 2012

SESSION 9
PLENARY: NUTRITIONAL GENETICS – DISCOVERING NEW PRACTICE HORIZONS

SYLVIA ESCOTT STUMP
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The aims of this presentation will be to provide a deeper appreciation of the role of nutrition in genetics. Differences between the stable human genome and the ever-changing microbiome have led to discoveries of the single nucleotide variants and dietary changes that affect human health. The Human Variome Project documents specific genes and their relationship with diseases. Recent studies show that epigenetic misprogramming during the developmental years, as well as alterations during aging, have important implications in disease management. Key nutrients affecting gene expression include folic acid, Vitamins B-12 and Vitamin D. Tumorigenesis and several age-related diseases are linked to DNA methylation-dependent activities. Thus, dietitians should understand the significance and be ready to create new employment opportunities in the emerging fields of Nutrigenomics and Nutritional Genetics. Competencies, knowledge and desirable professional traits have been identified and adopted for interpretation of genetic and genomic information and personalized nutrition therapy.

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PLENARY: MAKING A DIFFERENCE WITH DIETETICS

PAULINE MULHOLLAND
Abstract not received for publication

MORNING CONCURRENT SESSIONS – SESSION 10
10.1 BEST PRACTICE IN NUTRITION AND DIETETICS EDUCATION AND PRACTICE

The first three abstracts for this session were not decided before publication

243. SIMULATION IN DIETETIC EDUCATION IN AUSTRALIA

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Simulation is an educational technique to replace or amplify real experiences with guided experiences that evoke or replicate substantial aspects of the real world in an interactive manner. It is widely used in medical and nursing education. Simulated learning experiences (SLEs) can be categorised by their technologies as: (1) Paper-based (eg, traditional case study exercises; menu budgeting); (2) Electronic (eg, computer or video simulations), or (3) Physical (eg, using mannequins or standardised patients). In 2011 the Dietitians Association of Australia conducted a survey of the use of simulated learning experiences in all universities offering dietetic courses in Australia. A total of 35 SLEs currently used were identified: 14 paper-based, 15 physical-based and

6 computer or video-based. The most frequently employed methods were the use of paper-based clinical case management plans, and simulated patient interviews with student or actors as standardised clients. Sixteen potential new SLEs were also described. Dietetic educators would welcome resources to develop additional and more sophisticated SLEs, particularly related to inter-active multi-media case studies, gaming simulation of public health interventions, virtual supermarket tours, electronic menu planning tools and simulated hospital ward environments, but these would require substantial additional resourcing. It was agreed that additional SLEs would enhance dietetic student learning and preparedness for practice, but it is unlikely that they can significantly reduce the current times mandated for clinical placement.

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150. DEVELOPMENT OF A NUTRITION COMPETENCY FRAMEWORK FOR MEDICAL GRADUATES

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One of the barriers in the prevention of chronic disease and medical complications is lack of appreciation, by the medical profession of the importance of implementing strategies to treat over and under nutrition. The minimal emphasis placed on nutritional competencies within medical programs in Australia contributes to this inaction. Nutritional competencies have been developed for and accepted by the medical profession overseas (Jackson *et al.*, 2001). We aim to develop a nutrition competency framework (NCF) for the medical course at Deakin University. Information on nutrition content of the 18 medical courses across Australia was collected through a telephone survey, and focus groups with 25 Deakin medical students were held to assess attitudes to inclusion of nutrition in the medical course. Results indicate that currently no nutrition competencies exist in any medical course, although all courses include some nutrition content, which is valued by educators. The focus groups with students identified nutrition as a gap in the current course. We are developing the NCF guided by the Framework of Competencies for Medical Graduate Outcomes 2011 (MDANZ, 2011) and the nutritional competencies developed overseas. As part of the process, nutritional learning outcomes are being included in problem based learning cases, and will initially be evaluated using observation methods. The implementation of the framework will commence in 2012; evaluation will include assessment of student nutritional competency. It is anticipated that with appropriate consultation the NCF will be valued by educators and students and successfully integrated into the existing medical curriculum.

46. "THIS IS WHERE IT ALL STARTED": NEW DIETETIC PRACTITIONERS PERSPECTIVES OF THEIR EDUCATION AND TRAINING

JENNIFER BRADY[1], **DAPHNE LORDLY**[2], DEBBIE MACLELLAN[3], JACQUI GINGRAS[4]
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Understanding dietitian professional socialization is important to the improvement of academic and practicum curricula and to the future growth of the dietetic profession. To elucidate the complex phenomenon of dietitian professional socialization, this study sought to answer: (1) What influencing factors impact people's decisions to pursue a career in dietetics? and (2) How are the education and training processes implicated in the professional socialization of dietitians? Participants (n = 12) included alumni from three Canadian universities representing different entry-to-practice models. All participants had three or less years of work experience. Three one-on-one interviews were conducted with each participant over the course of one month. The key influencing factor in the decision to pursue dietetics was participants' perceived congruence between dietetics and other aspects of their lives including: early interests and experiences (sport, food and cooking, science, illness or eating disorder); career aspirations (health care); and social networks (desire to be a professional). A pivotal experience during high school (high school careers class or encounter with an influential person) or while already enrolled in or after graduation from another university or training program (nutrition course or job search), prompted participants' awareness of and subsequent decision to pursue dietetics. Supportive relationships were vital to participants' professional socialization. It is important that recruitment materials and undergraduate education opportunities allow aspiring dietitians to, early on, develop a clear idea of what it means to be a dietitian. Dietetic educators must attend to the informational as well as relational aspects involved in shaping future practitioners' dietitian identities.

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850. ROUTINE HOSPITAL SCREENING TOOL (NRS-2002) IS ADEQUATE FOR IDENTIFYING MALNOURISHED DIALYSIS PATIENTS IN MALAYSIA

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Malnutrition is prevalent in more than 50% of patients on maintenance haemodialysis (HD) and continuous ambulatory peritoneal dialysis (CAPD) in Malaysia. Availability of renal dietitians is limited and a nutritional screening tool to identify patients at risk in large facilities to prioritize dietary counselling is needed. We conducted a study from June to November 2011 to test several simplified nutritional screening tools on 155 HD and 90 CAPD patients to validate the potential application of the tools. The simplified nutritional screening tools commonly used for routine screening of hospitalized patients (NRS-2002, MST, MUST) were compared against tools developed for assessing dialysis patients such as the malnutrition-inflammation score (MIS), Subjective Global Assessment (SGA) and geriatric nutritional risk index (GNRI). The usefulness of each nutritional screening tool for identifying nutritional risk was assessed by comparison with the MIS & SGA values and various individual anthropometric and biochemical nutritional measures. The NRS was considered to be the most accurate in identifying dialysis patients at nutritional risk, because the area under the receiver operating characteristic curve generated with the SGA and MIS value was the largest. The NRS sensitivity and accuracy of predicting malnutrition according to the SGA averaged at 58%, whilst according to MIS averaged at 69%. Routinely used hospital malnutrition screening tools such as the NRS-2002 can be utilized for identifying malnourished dialysis patients in Malaysia and dialysis population specific tools may not be necessary. The GNRI tool developed by Japanese researchers was found to be least applicable for Malaysian population.

Funding source: International Medical University

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912. TYPE 2 DIABETES: MEDICARE EPC REFERRALS TO PRIVATE PRACTICE DIETITIANS, DO THEY WORK?

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The Australian Government Medicare Enhanced Primary Care (EPC) initiative for chronic disease management (CDM) enables patients with Type 2 diabetes (T2D) to access subsidised consultations with dietitians. This research aimed to investigate the changes in weight and waist circumference of patients with T2D under the care of a dietitian within the framework of the Medicare EPC initiative. An observational study was conducted over nine months which included 129 participants (58.9 ± 15.7 years, 32.2 ± 5.6 kg/m^2) diagnosed with T2D. Patients were referred to see the dietitian via an EPC referral under a GP Management Plan and Team Care Arrangement (CDM items 721, 723) and were eligible for one, to a maximum of five subsidised consultations. Weight and waist circumference were collected by the dietitian at each consultation. Information regarding service utilisation, previous dietetic care and length of T2D diagnosis was also collected. Statistically significant reductions in body weight (1.9 ± 2.9 kg, $p \leq 0.05$) and waist circumference (2.0 ± 4.8 cm, $p \leq 0.05$) were observed from the initial to final consultation. Participants who attended more than two consultations with the dietitian lost significantly more weight than those who only attended two consultations (3.7 ± 4.15 kg vs 1.1 ± 1.6 kg, $p \leq 0.05$). Almost one third of participants (n = 38, 30%) did not fully complete their referred consultations with the dietitian. Modest weight and waist circumference changes are achievable for patients with T2D within the framework of the Medicare CDM program. These changes are not likely to be clinically significant in the short term. Results suggest that increasing the number of times patients visit a dietitian may facilitate better health outcomes.

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The remaining abstracts for this session were not decided before publication

10.2 Food Service and Disaster Management LEAD SESSION: DIETITIANS AS LEADERS/ LEADERSHIP ACROSS THE WORLD

DHARINI KRISHNAN
Abstract not received for publication

472. CONSIDERATION FOR RISK AVERSION PROGRAMMING AT THE TIME OF THE DISASTERS

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It was an unforgettable day for a Japanese on March 11, 2011. This is because powerful earthquake and tsunami hit East Japan directly. Very many Japanese died from this. In addition, many people are missing now. The hospital overflowed with an injured person, too. The reason that damage extended in this way is because we had the natural disaster that was far beyond expectation. In the soup-kitchen, it is usually built a basement or the first floor. Therefore most facilities for providing meals became unusable by this natural disaster. In addition, the many stored food could not be eaten. The Japanese learned many things from this natural disaster. We need to make the manual of anti-disaster measures and the management. We report the new anti-disaster measures in a completed facilities for providing meals. It is necessary to install facilities for providing meals in the upper floor of the building from now on. In addition, we store the storage of the food in the upper floor of the building, and it is necessary to prepare for a disaster. In addition, we will construct the public important building on the hill, and it is necessary to function as shelters. We will report it that our managing of the food supply is in Japan, now.

554. DIETITIANS CONTRIBUTION TO COMMUNITY RECOVERY AFTER THE CHRISTCHURCH, NEW ZEALAND EARTHQUAKES 2010 AND 2011

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Both natural and man-made disasters place special burdens on hospitals and health professionals, which have a unique role during these events. No matter how badly their infrastructure is disrupted, they must continue to function. The devastating events in Christchurch on September 4, 2010 and February 22, 2011 resulted in an extraordinary effort by healthcare staff including dietitians to take care of patients and keep health services running. Food Services were faced with providing and distributing meals to patients and staff with no electricity, water, lighting, lifts, and few remaining employees. Despite manuals and emergency procedures being in place there was little time to consult them. Rapid decisions were made meal by meal based on instinct and what utilities, staffing and food was available at the time. Many dietitian's lost houses, possessions, income and most tragically colleagues, friends and family members. Nutrition outpatient clinics were cancelled initially then experienced more attendance due to the ongoing stresses of aftershocks, traffic and parking issues. 70,000 people initially fled the city but many returned after power was restored to their homes and workplaces. 1,000 hospital staff including diabetes and public health dietitians were displaced from office buildings. Student dietitian training was severely disrupted with clinical placements being temporarily suspended with half the Christchurch based students having to relocate to other parts of New Zealand to complete the academic year. Dietitians in Canterbury appreciate the support from the dietetic community are now learning to work in a radically changed city and health environment.

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704. A LEAP INTO FOODSERVICE SATISFACTION IN THE PRIVATE ACUTE CARE SETTING

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Monitoring foodservice satisfaction is a risk management strategy for malnutrition in the acute care sector, as low satisfaction may be associated with poor intake. This study aimed to investigate the relationship between age and foodservice satisfaction in the private acute care setting. Patient satisfaction was assessed using a validated tool, the Acute Care Hospital Foodservice Patient Satisfaction Questionnaire for data collected 2008–2010 (n = 779) at a private hospital, Brisbane. Age was grouped into three categories; <50 years, 51–70 years and >70 years. Fisher's exact test assessed independence of categorical responses and age group; ANOVA or Kruskal–Wallis test was used for continuous variables. Dichotomised responses were analysed using logistic regression and odds ratios (95% confidence interval, $p < 0.05$). Overall foodservice satisfaction (5 point scale) was high (≥4 out of 5) and was independent of age group ($p = 0.377$). There was an increasing trend with age in mean satisfaction scores for individual dimensions of foodservice; food quality ($p < 0.001$), meal service quality ($p < 0.001$), staff

service issues ($p < 0.001$) and physical environment ($p < 0.001$). A preference for being able to choose different sized meals (59.8% > 70 years vs 40.6% ≤50 years; $p < 0.001$) and response to 'the foods are just the right temperature' (55.3% >70 years vs 35.9% ≤50 years; $p < 0.001$) was dependent on age. For the food quality dimension, based on dichotomised responses (satisfied or not), the odds of satisfaction was higher for >70 years (OR = 5.0, 95% CI: 1.8–13.8; <50 years referent). These results suggest that dimensions of foodservice satisfaction are associated with age and can assist foodservices to meet varying generational expectations of clients.

100. THE FOOD TO PREPARE MEASURES FOR DEALING WITH DISASTERS

NAOMI KATAYAMA, **TAKIKO SAGARA**
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Natural disasters are hard to prevent. Tohoku region which is north part of Japan suffered great damage from the heavy "Earthquake and Tsunami." At that time, people were waiting disaster relief from everyone, especially the government. In this case, we learned many things and we need to make the national disaster act. Preparing measures for dealing with disasters is very difficult, however we need to make it for the stricken area. Food and water were a very important lifeline but people could not get enough after the first three days. We are Registered Dietitians and we need to keep the food supply for the Earthquake and Tsunami victim. A stricken area meal includes the meal set which I can store for five years. The contents of the set are rice of the freeze dry, water, a plate, a rice scoop, and chopsticks. There is several kinds of taste and can prepare for one meal for 50. The stricken area meal set was cooked by using water, hot water, a microwave oven. Thirty University female students ate the stricken area food, which was cooked by several methods. They answered the sensuality-examination questionnaire. The result was that many subjects answered that the stricken area food, which was made by hot water, was delicious. However, the stricken area food, which was made by water, they could eat enough too. In future, we would like to make more delicious stricken area food and we would like to make balanced menu to avoid malnutrition.

955. DOES CHOOSING MEALS CLOSER TO SERVING INCREASE PATIENT INTAKE?

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The menu system at the Royal Brisbane & Women's Hospital operated a manual ordering system whereby patients, under guidance of Dietetic Assistants, chose meals for the next day. Menu changes between menu collection and patients receiving their dinner the next day were in the order of 40% (180–230 changes out of 500–550 total menus) and 35% at lunch. Apart from time spent making menu changes, many patients received a default menu choice, often forget what they ordered, or didn't feel like eating what they had chosen a day earlier. There was also significant plate waste. The literature suggests that changing menu ordering closer to consumption improves patient intake, but data are limited. A significant change management process was undertaken during 2010–2011 to change to menu distribution and collection for the same day lunch, dinner and next day breakfast. Outcomes include: a reduction in menu changes down to average 7% at lunch and 10% at dinner – with time saved allowing Dietetic Assistants more time on wards at meal times; and a reduction in default menus at lunch by 60% (from 60 to 20). Average total plate waste has also reduced from 36% and 34% in 2009 and 2010 respectively, to 24.6% in 2011. As there have been no other major changes to the food service system or menu during this time, it is surmised that this significant reduction in plate waste corresponds with an increased patient intake related to same day menu selection.

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The remaining abstracts for this session were not decided before publication

10.3 MICRONUTRIENT AND HEALTH 1 LEAD SESSION: HARMONIZATION OF MICRONUTRIENT-BASED DIETARY STANDARDS GLOBALLY: CHALLENGES AND FUTURE DEVELOPMENTS

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The terminology and framework for setting nutrient-based dietary standards (NBDS) varies across countries leading to discrepancies in health, food policies, and trade. Hence, harmonizing approaches for NBDS warrants investigation. A working group reviewed the terminology used to define NBDS and upper levels, statistical approaches for their use for individuals and populations, criteria to establish requirements, extrapolate and interpolate missing data, bioavailability issues, and the potential impact of inter-individual variations other than life-stage and gender on nutrient requirements. The group proposed the term – nutrient intake values (NIVs) – that include the average nutrient requirement (ANR) and upper nutrient level. An individual nutrient level (INLx) based on the ANR was also proposed, the x representing the percentile for an acceptable risk for inadequacy for an individual. To assess nutrient adequacy and plan diets for groups, use of the ANR cut-point or probability approach was recommended. In the future NIVs may be set that take into account inter-individual differences in lifestyle, environment, health, genotype, and epigenetics. Use of the proposed terminology and framework for NIVs has global potential for evaluating nutrient intakes and diets for individuals and populations and for use in several aspects of food and nutrition policy.

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356. LOW MICRONUTRIENT INTAKES OF PRESCHOOL CHILDREN: WHEN TOO MUCH IS NOT ENOUGH

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Micronutrient malnutrition, a serious childhood dietary concern for developing countries, results largely from poor dietary quality, or inadequate food intake and can occur even when individuals living in poverty have enough to eat. It is well established that a well-nourished child performs better in school and grows into healthy adulthood (UNICEF, 2006). This cross-sectional study examined diet-quality and nutrient adequacy of 466, 2–5 year-old children from the Caribbean. Data were obtained from parents and caregivers using established dietary intake methods. Food variety (FVS), dietary diversity scores (DDS) and nutrient adequacy ratios (NAR) were calculated using Food and Agriculture Organizations/World Health Organization (2004) recommended methods. Mean scores for FVS (9.38 ± 2.4) DDS (4.21 ± 0.85) and NAR (1.34 ± 0.54) were obtained. Food-items most frequently consumed were grains, roots and tubers (99%), fish (92%), vitamin A-rich plant foods (80%), eggs (76%), dairy (≥60%), foods cooked in fats and oils (99.8%) and fatty-meats 40%. Foods less frequently consumed were fruits (49%), vegetables (39%), and legumes (29%). Significant correlations and differences were obtained for specific variables. Mean intakes of iodine, iron, zinc, vitamin A, folate, calcium and magnesium were significantly ($p < 0.00$) lower than RDA for age and gender. Significant regional differences were found. There is a paucity of data on the actual prevalence of micronutrient deficiencies in the Caribbean. Findings showed that intakes for multiple micronutrients are lower than recommended allowances, suggesting the need for simple approaches that evaluate micronutrient malnutrition in community-based settings. Clinical assessment and nutrition education for parents is vital for this population.

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690. THE IMPACT OF DIETARY FOLATE CONSUMPTION ON THE PREVALENCE OF MIGRAINE WITH AURA DISABILITY AND FREQUENCY

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Griffith University, Australia

The Methyltetrahydrofolate Reductase (MTHFR) C677T genotype has been associated with an increased risk of experiencing Migraine with Aura (MWA). Folic acid, Vitamin B12 and B6 supplementation has been shown to decrease migraine symptoms. It has not yet been determined if levels of dietary folate consumption influence the severity of migraine symptoms. Dietary folate consumption of Australian females with clinically diagnosed MWA (n = 147) was analysed over 6-months to determine if an association existed between folate consumption, MTHFR polymorphisms, MWA frequency and disability prevalence. Subjects were instructed to complete 14 daily diet diaries over 6 months. Folate was analysed as: Total Food Folate (TFF), Folic Acid (FA) and DFE (Dietary Folate Equivalents). Intake was compared to MWA frequency, disability, and serum biomarkers. Mean folate consumption (545 ± 241 DFE) was greater than current Australian RDIs (400 DFE). Baseline mean FA (98 μg) intake was lower than average FA intake over 6 months (118 μg, P = 0.037). At baseline, migraine frequency was inversely related to FA (r = –0.222, P = 0.0009) and DFE (r = –0.177, P = 0.037) consumption. Serum folate levels significantly increased (P = 0.049); migraine disability decreased by 13.7%. Mandatory fortification policy of wheat flour with FA during the trial may have increased FA consumption over the trial. Australian females with MWA may need to increase the intake of dietary folate well above the current RDI to alleviate migraine symptoms.

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601. A SYSTEMATIC REVIEW OF VITAMIN D AND CANCER – PERILS OF DEFICIENCY AND IMPLICATIONS FOR PRACTICE

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Clinicians do not routinely screen or supplement vitamin D in cancer care. However, vitamin D deficiency (<50 nmol/L) and insufficiency (50–75 nmol/L) may impact on wellbeing and treatment outcomes in patients with cancer. This systematic literature review aims to provide guidance to clinicians on the management of vitamin D deficiency and insufficiency throughout the cancer journey. A retrospective literature review (January 2000 to July 2011) on Medline, PubMed, CINAHL and the Cochrane Database was conducted. Search key words included "vitamin D" or "25-hydroxyvitamin D," and "cancer," "cancer prevention," "cancer treatment," "chemotherapy" or "vitamin D supplementation." One hundred and fifty-six abstracts were identified, 25 studies met the inclusion criteria and were graded using the NHMRC evidence hierarchy. Results evaluated prevalence of vitamin D deficiency and insufficiency and associations between vitamin D levels and cancer incidence and treatment outcomes. Vitamin D deficiency and insufficiency were highly prevalent among cancer patients, ranging from 64% to 76% in patients with breast cancer, to more than 75% in those with colorectal cancer. Low vitamin D status was associated with increased risk of distant recurrence and poorer outcomes and prognosis. In conclusion, low vitamin D status is common amongst cancer patients, has adverse impact on outcomes and vitamin D screening for cancer patients may need to be considered. More research is needed to investigate potential effects of vitamin D supplementation and dietitians are well placed to lead this multidisciplinary research.

Funding source: University of Queensland Summer Scholarship program

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522. PREVALENCE OF FAT SOLUBLE VITAMIN A AND D DEFICIENCY IN AN AUSTRALIAN ADULT CYSTIC FIBROSIS CENTRE

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Multiple randomised controlled trials have found individuals with cystic fibrosis (CF) have lower levels of serum retinol and calcidiol (25-hydroxy-vitamin D) and consequently higher prevalence of vitamin A and D deficiency. Australasian best practice guidelines for nutrition management in CF (2006) recommend routine measurement and supplementation of fat soluble vitamins A, D, and E in CF patients with pancreatic insufficiency. Despite this, Vitamin A and D deficiency remains prevalent. Our aim was to identify the prevalence of deficiency in our CF population in order to inform the development of a screening and supplementation protocol. Serum Vitamin E level deficiency is rare and will not be reviewed in this study. Retrospective data collected for 300 patients included patient demographics, clinical measures and annual retinol and calcidiol levels. Ongoing data analysis is currently looking at prevalence of deficiency and subsequent supplementation prescribed. Full data presented will include the analysis of correlating factors and their impact on deficiency in this sample. Annual monitoring of fat soluble vitamins in our population is fundamental in timely identification of deficiency levels. Interpretation of biochemical results is complicated by factors such as worsening lung disease, inflammatory states and ascertaining patient adherence to standard supplementation. Vitamin A deficiency has significant clinical implications such us increased susceptibility to infections. Vitamin D deficiency has a negative impact on bone health; increasing risk of CF related osteoporosis. Results from this clinical audit will be used to develop a protocol for our Adult CF Centre to facilitate appropriate screening and supplementation of vitamins A and D.

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660. VITAMIN D INTAKE, SUN EXPOSURE AND 25-HYDROXY VITAMIN D STATUS IN PERITONEAL DIALYSIS (PD) AND HAEMODIALYSIS (HD) PATIENTS

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Inadequate vitamin D levels have been linked to bone disease but more recently have been associated with wider health implications. Limited studies suggest a high prevalence of Vitamin D deficiency in dialysis patients, although evidence is lacking on whether this is due to dietary restrictions, limited mobility and time outdoors or a combination of these. The aim of this study was to assess the contributions of diet, supplements and sunlight exposure to serum Vitamin D (25(OH)D) levels in dialysis patients. Cross-sectional data were obtained from 30 PD (Mean ± SD age 56.9 ± 16.2 years; n = 13 male) and 22 HD (Mean ± SD age 65.4 ± 14.0 years; n = 18 male) patients between 2009 and 2010. Serum 25(OH)D was measured and oral vitamin D intake esti-

mated through a food-frequency-questionnaire and quantifying inactive supplementation. Sunlight exposure was assessed using a validated questionnaire. Prevalence of inadequate/insufficient vitamin D differed between dialysis modality (31% and 43% insufficient (<50 nmol/L); 4% and 34% deficient (<25 nmol/L) in HD and PD patients respectively ($p = 0.002$)). In HD patients, there was a significant correlation between diet plus supplemental vitamin D intake and 25(OH)D ($\rho = 0.84$, $p < 0.001$). Results suggest a higher frequency of 25(OH)D inadequacy/deficiency in PD compared to HD patients. No other relationships between intake, sun exposure and 25(OH)D were seen. This could reflect limitations of the study design or the importance of other factors such as age, ethnicity and sun protection as interactions in the analysis. Understanding these factors is important given Vitamin D's emerging status as a biomarker of systemic ill health.

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The remaining abstracts for this session were not decided before publication

10.4 Diet and Lifestyle Related Disease LEAD SESSION: DAIRY FOODS AND CARDIOVASCULAR DISEASE – DOES THE EVIDENCE STACK UP?

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Full-fat dairy products such as whole milk, butter and cheese contribute to the intake of saturated fat and cholesterol, and consumption of these products has long been considered a potential risk factor for cardiovascular disease. However, there is no consistency in the relationship between intake of dairy products and cardiovascular incidence or mortality. Current evidence shows that the effect of dietary cholesterol on plasma cholesterol is determined by several factors and not as strong as previously thought, while the effect of particular foods on cardiovascular disease risk cannot be predicted solely by their content of saturated fatty acids. Also it has been suggested that dairy products contain other nutrients that have beneficial effects on cardiovascular health. In this seminar I will review current evidence of the role of dairy intake in the risk of cardiovascular disease and related health outcomes, including consideration of possible programming effects early in life. I will also discuss the various nutrients contained in dairy products that may have relevant biological effects. Data will be presented from the Boyd Orr cohort, a 65-year follow-up of children in Britain. Contemporary results will be shown from a population-based 14-year cohort study of Australian adults.

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348. DIABETIC HOSPITALIZED PATIENTS – NUTRITIONAL KNOWLEDGE, ATTITUDES AND, HISTORY OF DIETETIC CONSULTATION SURVEY

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Hospitalization is considered a window of opportunity for promoting adoption of healthier lifestyle interventions. The aim of this survey was to learn the features of the demographics, nutritional knowledge, attitudes and the history of Dietetic consultation prior to hospitalization. 100 diabetic patients hospitalized in internal, orthopaedics and cardiology wards were included according to inclusion criteria. Results: 54% were women, average age 62.1 ± 9.8, average years of education 11.6 ± 1.7. 28% learned < 10 and 85% learned < 12 years. 97% of the survey population considers nutrition as an important factor in treating diabetes and preventing its complications. 99% think that the hospital food should reflect the recommended diet but 60% think the hospital food does not suits the recommendations. 97% of the survey population received dietary consultation from dietitian, but 80% received only one such consultation since they were diagnosed and 8% – 2 consultations, even though 45% had known diabetes over 10 years. 75% prefers to receive the dietetic consultation from a clinical dietitian and 10% from a dietitian and physician. Only 54% knew that sodium is related to salt and 45% that diabetics have a higher risk for heart disease. The high rates of low socioeconomic population among the hospitalized patients is a window of opportunity for reaching patients from the lower socioeconomically population, who is in higher risk for complications on one hand and less using vital professional dietetic help.

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657. DETECTION OF DIABETES IN SCHOOL CHILDREN FROM A MASS URINE SCREENING

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We have been observing an increasing number of children and adolescents with Type 2 diabetes (T2DM) in our clinics. Information about the epidemiology of T2DM in this group is lacking. The overall aim of the survey is to provide information about the current status of T2DM in children and adolescents attending schools in Trinidad and Tobago. The main objective is to assess the prevalence of diabetes in children attending schools from a mass urine screen program in Trinidad. A cross sectional survey was performed among school children aged 5–17 years in Trinidad during 2009 for glucosuria. Students were instructed to collect an early morning sample of urine at home and bring to school for testing using urine strip device. Students who had consecutive positive urine samples had an oral glucose tolerance test at the hospital. 67 000 (50.3%) students were screened. 23 students were identified with persistent glucosuria. 21 students had glucose tolerance tests done. 8 were confirmed diabetic: 1 Type 1 (boy age 12) and 7 Type 2 (5 female and 2 male). 5 students (4 female and 1 male) were diagnosed as pre-diabetic. Except the student with type 1 diabetes all students' BMI was > 85th percentile and all had *acanthosis nigricans*. There is a prevalence of 10/100 000 with T2DM, and 7/100 000 with impaired glucose intolerance among school children in Trinidad. The relatively high prevalence of undiagnosed childhood T2DM in Trinidad is a serious public health concern.

Funding source: Helen Bhagwansingh's Diabetes Education, Research and Prevention Institute, the University of the West Indies, St Augustine, Trinidad, W.I.

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1025. SYSTEMATIC REVIEW UPDATING THE EVIDENCE OF THE EFFECT OF LOW GI/GL DIETS IN THE TREATMENT OF OVERWEIGHT AND OBESITY IN ADULTS

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Diets low in glycaemic index (GI) and glycaemic load (GL) have been reported to have a role in the management of obesity and reduction in associated cardio-metabolic health risks. This systematic review evaluated the evidence for the role of low GI/GL diets on weight loss in overweight and obese adults. The review informed the revision of the Dietitians Association of Australia (DAA) Best Practice Guidelines for the Treatment of Overweight and Obesity in Adults. Randomised con-

trolled trials or systematic reviews in overweight or obese healthy adults published from 2003 to Dec 2010 were sourced from databases using standard search terms. Eligible studies had data extracted and were assessed for quality using the American Dietetic Association quality assessment checklist. The initial search located 440 articles. Six randomised controlled trials (RCT) that met the inclusion criteria had data extracted. Two studies reported greater weight loss with low GI diets however these were of short duration, 8–12 weeks, and had small sample sizes (n = 22–23). Four RCT's reported similar weight loss of –4.4 to –9.9 kg compared to 3.7 to –9.3 kg for low GI versus high GI energy restricted diets respectively at 12 weeks and –7.2 to –10.4 kg compared to –7.7 to –9.1 kg at 6 months. Energy restricted diets that are low GI/GL or moderate to high GI/GL are equally effective in achieving weight loss over a two to six month period. These findings have implications for DAA weight loss guidelines and dietetic practice regarding efficacy of diets with low GI/GL for obesity management.

Funding source: The Dietitians Association of Australia, University of Newcastle and the University of Canberra. C Collins is supported by an NHMRC Career Development Fellowship and M Neve by a Penn Foundation Post-Doctoral Research Fellowship in Obesity

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916. SOURCES OF SATURATED FAT AND THE ASSOCIATION WITH MORTALITY: A META-ANALYSIS

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Although current dietary guidelines advocate foods low in saturated fat, emerging evidence suggests that saturated fat may have a neutral effect on mortality and morbidity. Further, intakes of individual saturated fatty acids vary with different food types, yet health outcomes resulting from these different sources are currently unknown. This meta-analysis aimed to investigate the association between consumption of different foods high in saturated fat and mortality. The Cochrane library, MEDLINE, and EMBASE were searched for studies published in journals to May 2011. We identified 27 publications that used initially healthy adult populations with individual dietary data, with total, cancer, or cardiovascular mortality as end points, by category of food group intake. Data were extracted using standardised data forms and study quality was considered. The pooled relative risk estimates, which compared highest versus lowest quantiles of food intake, demonstrated that high intake of meat, milk, cheese, yoghurt and butter were not associated with a significantly increased risk of mortality in comparison to low intakes. However, high intake of processed meat was associated with an increased risk of both all-cause (RR 1.20, 95% CI 1.12–1.29) and CVD mortality (RR 1.12, 95% CI 1.07–1.17). In addition we investigated potential dose-response relationships. With the exception of processed meat, results generally suggested little or no increase in risk with increasing intake of foods high in saturated fat. While further research is required, our results suggest that existing dietary guidelines regarding intake of saturated fat may not reflect the current body of scientific evidence.

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812. POORER DIET QUALITY PREDICTS HYPERTENSION IN PREGNANCY

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Hypertensive disorders affect about 10% of all pregnancies and are a major cause of maternal and perinatal mortality worldwide. Maternal diet quality has been associated with several favourable pregnancy and birth outcomes. However, there are very few studies in this area and none on gestational hypertension. This study aims to test whether diet quality before or during pregnancy predicts gestational hypertension. Self-reported data were collected prospectively for the Australian Longitudinal Study on Women's Health. A sub-sample of 969 women, aged 25 to 30 years, who completed the Dietary Questionnaire for Epidemiological Studies up to 6 months before, or during a singleton pregnancy, were included. Diet quality was calculated according to the Australian Recommended Food Score (ARFS) method, which allots points for regular consumption of vegetables, fruits, protein foods, grains, dairy and fats. Eleven percent of women had gestational hypertension. The preconception (n = 386) and pregnancy (n = 583) groups were combined as no significant differences were detected for total and component ARFS scores. Women with hypertension, compared to those without, had lower scores for the total ARFS (mean ± SD: 27.3 ± 8.8 vs. 29.6 ± 8.6, p = 0.01) and grain component (3.9 ± 2.0 vs. 4.7 ± 1.9, p < 0.01). Both total ARFS [coefficient (95% CI): –0.15 (–0.27, –0.02), p = 0.02] and grain component [–0.03 (–0.05, –0.01), p = 0.02] remained predictors of gestational hypertension, after adjustment for weight, smoking, education, parity and maternal age in multivariate logistic regressions. Dietary intervention to improve women's diet quality before or during pregnancy, may help to reduce the occurrence of gestational hypertension.

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The remaining abstracts for this session were not decided before publication

10.5 ***Hot Topics***

949. PROGRESSIVE IMPROVEMENTS IN IODINE STATUS IN TASMANIA WITH VOLUNTARY THEN MANDATORY FORTIFICATION: PRELIMINARY RESULTS FROM THE 2011 TASMANIAN URINARY IODINE SURVEY

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In the late 1990s mild iodine deficiency emerged in Tasmania, Australia. In 2001 concerns about suboptimal neurological development associated with iodine deficiency led the Tasmanian Government to introduce voluntary iodine fortification. The baking industry was asked to replace regular salt with iodised salt in bread as an interim measure whilst longer term interventions were investigated. In September 2009 Australia and New Zealand introduced mandatory iodine fortification of salt in bread in response to widespread mild iodine deficiency. Cross sectional urinary iodine surveys of school children were conducted in Tasmania pre-fortification (1998–2000), following voluntary fortification (2003–2007) and post-mandatory fortification (2011). The purpose of these surveys was to monitor iodine status and assess the relative effectiveness of interventions. In 2011 classes containing fourth-grade children (aged 8–11 years) from all Tasmanian government, Catholic and independent schools were selected using a one-stage cluster sampling method, comparable with earlier surveys. Spot urine samples were tested for iodine at the Institute of Clinical Pathology and Medical Research in NSW. The World Health Organization defines population iodine status as optimal if median urinary iodine concentration (UIC) is 100–199 μg/L, with no more than 20% of samples less than 50 μg/L. Median UIC from the first 180 samples from the 2011 survey was 132 μg/L (IQR 96–198 μg/L; 2.2% < 50 μg/L), an improvement (p < 0.05) from voluntary fortification (median 108 μg/L; IQR 73–158 μg/L; 9.8% < 50 μg/L), in turn an improvement (p < 0.05) from pre-fortification (median 73 μg/L; IQR 56–100 μg/L; 19.5.% < 50 μg/L). These preliminary findings suggest mandatory iodine fortification has been more effective than voluntary fortification in correcting iodine deficiency in Tasmania.

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824. FOETAL ABDOMINAL FAT AREA IS PREDICTED BY THE PROTEIN-TO-CARBOHYDRATE RATIO OF MATERNAL DIET DURING PREGNANCY

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The thin-fat phenotype (small abdominal viscera, low muscle mass but preserved body fat) predisposes offspring to cardio-metabolic disease, and the prenatal environment can induce persistence changes in offspring phenotype. We investigated whether maternal macronutrient intake distribution throughout pregnancy predicts foetal body composition up to 36 weeks gestation. Data were collected prospectively from 179 Australian women with singleton pregnancies enrolled in the Women and Their Children's Health Study. Maternal diet during the previous three months was measured using a validated 74-item food frequency questionnaire at 18 to 24 weeks and again at 36 to 40 weeks gestation. Foetal body composition was measured at abdominal and mid-thigh sites during ultrasound repeated at 19, 25, 30 and 36 weeks gestation. Subcutaneous fat area at each site was calculated by subtracting lean area from total area. In linear mixed-model regressions adjusted for known confounders, maternal intakes of %E protein (coefficient –0.12; 95% CI –0.24, –0.01; $P = 0.04$), %E starch (coefficient 0.10; 95% CI 0.02, 0.18; $P = 0.01$) and the protein: carbohydrate ratio (coefficient –3.62; 95% CI –6.60, –0.64; $P = 0.02$) predicted percentage abdominal fat area, while %E saturated fat (coefficient 0.28; 95% CI 0.03, 0.53; $P = 0.03$) and %E polyunsaturated fat (coefficient –0.48; 95% CI –0.91, –0.05; $P = 0.03$) predicted percentage mid-thigh fat area. Results suggest there may be an ideal maternal macronutrient intake ratio that optimises foetal body composition. Foetal body composition may be modifiable by maternal dietary interventions and thus may play an important role in influencing the offspring risk of future disease.

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The remaining abstracts for this session were not decided before publication

10.6 Medical Nutrition Therapy LEAD SESSION: ADVANCES IN MEDICAL NUTRITION

PENNY KRIS-ETHERTON

Abstract not received for publication

706. NUTRITION CARE PROCESS (NCP) AND INTERNATIONAL DIETETICS AND NUTRITION TERMINOLOGY (IDNT) – STATE IMPLEMENTATION

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Following the Dietitian Association of Australia (DAA) endorsement of NCP/IDNT, the Queensland Health (QH) State Government instigated state-wide implementation (1.7 million km^2). To achieve timely outcomes, the project focused on early adaptors, developing shared tutorial materials and "partnering" sites for sustainability. The 0.6 full-time equivalent project manager conducted one train-the-trainer workshop, regular organisational and tutorial case-study teleconferences with 17 QH champions (1/district, 1 day/week, 20 weeks), and frequent email communication. Process and outcome evaluations included tutorial attendance and an anonymous electronic survey using open and closed-ended questions (5-point Likert scale) assessing IDNT perceptions, knowledge and utilisation, prior and subsequent to implementation. Implementation focused on key enablers identified with pre-implementation surveys (support, education and training; consistency and practice; resources). There were 2866 tutorial attendances by 279 QH dietitians over the 13 tutorials duplicated by district champions. The largest tutorial group spanned 1300 km. With non-attendances due to leave and part-time workforce, 81% completed at least 10/13 tutorials. Dietitians completing both pre and post-implementation surveys (n = 81) were representative of DAA membership in gender and practice years. Improvements occurred with IDNT familiarity (3.32 ± 1.01 vs 1.58 ± 0.55, $P < 0.001$), confidence (2.94 ± 0.87 vs 1.71 ± 0.6 $P < 0.001$) and preparedness (2.73 ± 0.80 vs 1.62 ± 0.61, $P < 0.001$). Ability to identify appropriate nutrition diagnoses improved (21% to 41%, $P < 0.001$) and the proportion of dietitians implementing IDNT increased (34% to 89%, $P < 0.001$). This project achieved major organizational change through local champions and local implementation solutions supported by resources and frequent electronic contact. Partnering 2–3 district champions greatly assisted sustainability in times of illness, secondment and natural disasters.

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183. SOCIOECONOMIC AND GENDER INEQUALITIES IN MEDICAL NUTRITIONAL TREATMENT AMONG DIABETIC PATIENTS

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The aim was to identify socioeconomic status inequalities in long term medical nutritional therapy (MNT) and short-term MNT, among Israeli adult diabetic patients in a large healthcare service. An analysis of data including 90,212 patients over the age of 18, registered as diabetics in the Maccabi-Healthcare Service (MHS) Diabetes Registrar was performed. Socioeconomic rank (SER) for each patient was drawn from the Israel Central-Bureau-of-Statistics SER by geographical area of residence. Medical nutritional therapy (MNT) was defined by number of visits to registered dietitians (RDs) as registered in the database and was defined as short-term MNT (one visit to the RD) and long-term MNT (two or more MNTs) during the previous two years. Newly diagnosed patients were individuals entering the diabetes registrar during the last three to four years and veterans patients were those diagnosed before 2000. Only 25.8% of the diabetes patients received MNT during the previous two years. Newly diagnosed patients received MNTs more frequently compared to veterans. Mostly, short term MNT was not dependant on SER. However, long term MNT was dependent on SER and gender. Women tended to receive MNT more frequently than men. Newly diagnosed diabetics in the highest SER quartile had a higher chance of receiving MNT after adjustment. A nationwide nutrition counselling service for diabetes patients is available and accessible for all the diabetes patients. However, the higher socioeconomic patients seem to have a higher rate of attending long term MNT therefore they receive a higher rate of continuity of care.

709. INCIDENCE OF METABOLIC SYNDROME AND IMPACT OF MEDICAL NUTRITION THERAPY ON METABOLIC SYNDROME AMONGST TYPE 2 DIABETIC POPULATION IN CENTRAL INDIA

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The aim of the study was to observe the incidence of metabolic syndrome (MS) in central India and study the impact of MNT on

MS in type 2 diabetics. 2337 diabetic subjects were screened for MS. 10% of the sample population aged 30–60 years selected by purposive sampling for follow-up study of 6-month duration. Impact of MNT observed on MS (as per International Diabetes Federation 2010 criteria). Anthropometric, biochemical and dietary assessment was done. Data obtained was subjected to statistical analysis – mean, standard deviation, percentage proportion and test for significance. Of 2337 subjects 19.22% of males and 41.08% females had MS. Mean waist-circumference (WC) and mean triglyceride (TG) was higher in males. Mean HDL was higher in females. 237 (10%) of the population aged 30–60 years were selected for MNT. 59% males with 22.14% having MS which declined post counselling to 18.57% whereas incidence of MS was significantly higher in females 47.42% which reduced to 26.80%. Incidence of central obesity higher in females (96.90%) with mean WC 97.49 ± 7.52 initially and 96.31 ± 8.07 post-counselling. 70% of males had WC > 90 cm with mean 102.94 ± 8.8 cm initially and 100.96 ± 7.9 cm follow-up ($p < 0.001$). Mean TG was 245.85 ± 90.83 mg/dl which reduced to 208.85 ± 59.60 mg/dl in females and 282.66 ± 102.20 mg/dl which declined to 247.81 ± 72.17 mg/dl and found significant ($p < 0.001$). No significant change in HDL noted. Incidence of MS reduced significantly post counselling. Study points to an urgent need for measures amongst population to prevent a catastrophic burden of life style disease by MNT. Physical activity and use of functional foods-plant sterol, viscous-fibre, nuts, fish, MUFA for management of MS be increased.

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10.7 Nutrigenomics and Dietary Methodology LEAD SESSION: RESEARCH IN NUTRIGENOMICS AND POTENTIAL APPLICATIONS TO PRACTICE

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Nutrigenomics reflects gene-diet interactions. In recent years, the science of nutrigenomics has become more sophisticated. We seek to answer the question as to what this might mean for the dietetics profession. We have critically reviewed recent developments in the area, and considered the importance of new business opportunities being opened up, that exploit the full potential of nutrigenomics for dietitians. Whereas early business models sold genetic test results through direct-to-consumer testing, new business initiatives move dietitians to a central role. This now provides a robust framework that can inform dietitians in their practice. This field represents an important advance for dietitians.

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1043. NUTRIGENOMICS AND PERSONALIZED NUTRITION

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Nutrigenomics aims to shed light on how human genetic variation can explain why some individuals respond differently from others to the same foods, beverages or supplements consumed. This area of research is revolutionizing the science of nutrition and creating a strong demand for tools that can provide personalized dietary advice. Personal genetic information has become increasingly accessible to the public as a result of direct-to-consumer (DTC) genetic tests, however, concerns have been raised over their value and potential risks. Current genetic tests are largely unregulated, though some measures are being taken to regulate this emerging market in certain jurisdictions. Proponents of DTC genetic testing assert that providing consumers with personalized genetic information will motivate them to adopt healthier lifestyle and dietary habits aimed at reducing risk of disease. However, the effects of providing personalized genetic information on behavioural change remain unknown. As the science of nutrigenomics develops with clear examples of benefits for personalized nutritional advice, there will be a growing need for dietitians to have access to credible genetic test kits to enable them to provide the necessary information and advice for those seeking to improve their health by optimizing their nutritional status.

528. SEVEN OUT OF TEN MOST POPULAR VEGETABLES REMAIN TOP CHOICE DURING FIRST 3 MONTHS OF A 12 MONTH WEIGHT LOSS DIETARY INTERVENTION TRIAL

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Increasing vegetable consumption is part of dietary advice for weight loss, but how this converts to vegetable choices is not known. In this context, our aim was to identify the main vegetable groups reported by the study sample in the Healthy Eating and Lifestyle Trial (ACTRN1260000784011) at baseline (Oct 2010–Feb 2011) and after 3 months (Feb–May 2011). Data from diet histories (DH) were analysed using the AUSNUT 2007 database in Foodworks (Xyris, version 6.0.2562) to determine the average daily amount (g) of vegetables consumed by the study sample. Baseline DH (n = 113 subjects; 85 female) exposed 32 vegetable categories. The top 10 : tomato (69.9 g), potato (58.2 g), cucumber (27.5 g), carrot (25.7 g), lettuce (19.4 g), broccoli (17.0 g), mixed vegetables (15.3 g), leafy greens (12.2 g), onion (12.0 g), avocado (12.0 g) contributed to 74% of the total (365 g/day). After 3 months (n = 109 subjects), 7 remained in the top 10 (contributing 72% of average consumption, 505 g/day), with legumes (35.0 g), capsicum (22.8 g), pumpkin (15.4 g) replacing leafy greens, onion, avocado. Tomato remained top ranked but potato dropped from 2nd to 5th rank (58.2 g vs 36.5 g), and mixed vegetables shifted from 7th to 4th (15.3 g vs 39.1 g). Baseline intakes were similar to National Nutrition Survey 1995 levels (240–300 g). Consumption appeared to increase for the group, above the Australian Guide to Healthy Eating recommendation of ~ 375 g/day. Advice to increase vegetables may influence vegetables choices, with tomatoes a mainstay and frozen vegetables a feasible option. More detailed analysis may be informative for strategies to increase vegetable consumption in this context.

Funding source: Horticulture Australia Limited

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328. FRUIT AND VEGETABLE INTAKE AMONG ADULTS IN SRI LANKA

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Fruit and vegetable intake is an important part of a healthy diet and is associated with numerous positive health outcomes. The 2011 Sri Lankan food based dietary guidelines recommend the consumption of a minimum 2–3 portions of fruit, 3–5 portions of vegetable and at least 5 varieties of fruits and vegetables per day. Our main aim was to determine median fruit and vegetable consumption from all dietary sources among Sri Lankan adults. A nationally-representative non-institutional sample of adults was selected using a multi-stage random cluster sam-

pling technique. An interviewer-administrated 24-hour dietary recall was used to obtain dietary data. Fruits, vegetables and leaves of all kinds and fresh, canned, frozen, cooked, or raw, and juices all count in the diet. Portion sizes were estimated by standard method recommended by local and International nutrition authorities. The average daily consumption of fruits and vegetables were 0.43 (± 0.62) portions and 1.73 (± 1.25) portions, respectively. Men consumed more vegetables (1.95 ± 1.42) compared to female counterparts (1.61 ± 1.13) ($p < 0.05$), but not fruits (M: 0.44 ± 0.77; F 0.43 ± 0.65). Sri Lankans eat around 2.2 portions of fruits and vegetable per day. In the study population, only 6% and 15% achieved minimum daily requirements for fruit and vegetable, respectively. Only 3.5% of the adults sampled met the requirement of five portions of fruit and vegetables per day. In conclusion, few Sri Lankan adults reported consuming the recommended amounts of fruits or vegetables. Increasing fruit and vegetable consumption is an important public health strategy for the reduction of risk for chronic disease.

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The remaining abstracts for this session were not decided before publication

10.8 Diet and Lifestyle
LEAD SESSION: EMERGING EVIDENCE ON THE BENEFITS OF CEREAL FIBRE

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Historically whole grains were promoted because they were a rich source of fibre and higher intakes of fibre were linked to less chronic disease. Prospective, cohort studies, which are important evidence for dietary recommendations, find that both whole grains and cereal fibre are protective against cardiovascular disease, obesity, type 2 diabetes, and some forms of cancer. Unfortunately, food frequency instruments are unable to separate out the intake of whole grains and cereal fibre, although it is assumed that the health benefits of whole grains are associated with their fibre and germ content, not the calorie-rich endosperm. Many public health messages now suggest that consumers increase whole grains, without a mention of cereal fibre intake. Yet many whole grain ingredients (rice, corn, for example) are very low in fibre. So whole grain products made from these grains are poor sources of dietary fibre. Additionally, intervention studies with whole grain foods have shown few health outcome improvements, while cereal fibre studies consistently show improvements in biomarkers. For example, wheat bran consistently improves gut health outcomes in studies while more viscous cereal fibres, oat and barley, lower serum lipids and improve glucose response. Other cereal fibres, specifically rye bran, are more satiating than isolated fibres and may play an important role in obesity prevention. Thus, public health recommendations that support whole grains, rather than cereal fibre, may not result in improved health status if consumers choose whole grain products that are low in cereal fibre and often are high in calories and sodium.

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338. FRUIT AND VEGETABLE CONSUMPTION AND RISK OF TYPE 2 DIABETES MELLITUS IN IRAN

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Emerging evidence suggests a prominent role for fruit and vegetable intakes in reducing the risk of several chronic diseases; however, little is known about how it affects the diabetes risk. The aim of this study was to examine the extent to which fruits and vegetables intake is associated with type 2 diabetes risk. In this cross-sectional study, 460 women aged 20–50 years were selected by stratified random sampling in Tehran. Dietary intakes were characterized using validated food frequency questionnaires. Multivariate adjusted logistic regression was used to estimate odds ratios (OR) and 95% confidence intervals (CI). The mean daily intake of fruits and vegetables was lower among diabetic subjects compared to those who were free of this disease ($p < 0.001$). After adjusting for confounders, being in the highest quartile category of fruit and vegetable intake was significantly associated with reduced diabetes risk (OR: 0.67, 95% CI: 0.37–0.85, p-trend: 0.007). Specifically, higher consumption of orange, kiwi and olive was significantly associated with 94.8%, 81.9% and 59% lower risk of diabetes (p-trend: <0.05); while diabetes risk increased monotonically by increasing intake frequencies of artificial fruit juice and fried potatoes (p-trend: <0.001). It appears that fruit and vegetable intakes may have a protective role against diabetes risk in a dose-response manner. The increased burden of type 2 diabetes in the Middle East is associated with the recent changes in dietary habits, which are amenable to behaviour change, reinforcing nutritional messages on the importance of a healthy diet, and implementing policies to improve the supply of healthy foods seem essential at the population level.

427. THE EFFECT OF SEASONAL HEAT ACCLIMATISATION ON FLUID AND ELECTROLYTE LOSSES IN ENDURANCE TRAINED ATHLETES

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Heat acclimatisation results in several thermoregulatory adaptations which serve to reduce the physiological strain associated with exercise in the heat. These include an increase in sweat rate and aldosterone mediated conservation of sweat sodium. Few studies have investigated the effect on sweat potassium losses. The aim of this study was to document the effect of seasonal heat acclimatisation on sweat rate and sweat electrolyte losses (sodium and potassium) in a group of highly trained endurance athletes. Twenty-six athletes completed 2 exercise sessions on separate days in an environmental chamber. Trials were completed at the end of both the summer and winter months. Sweat rate was calculated from loss of body mass over time. Sweat collecting devices were attached to the upper arms and legs. Sweat rates were higher and sodium concentrations were lower at the end of the summer period. Sweat potassium loss was significantly greater ($p < 0.05$) in the legs at the end of the summer period (winter: 7.1 mmol/L, summer 8.3 mmol/L). There was a significant reduction in sweat sodium concentration at the end of summer in both the arms and legs (winter: 53.4 mmol/L, summer 46.0 mmol/L). The data from this study predicts that endurance athletes with high sweat rates are at risk of both sodium and potassium deficiency if dietary intake is not sufficient to replace losses. Emphasis on the replacement of both fluid and electrolyte losses accompanying prolonged exercise in the heat is important in order to avert potential heat related illness and maintain performance.

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687. A MULTIDISCIPLINARY, NON-DIETING APPROACH TO WEIGHT LOSS, DOES IT WORK?

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The aim was to measure the effectiveness of a multidisciplinary group program and health coaching clinic, utilising a non-dieting approach in long term weight reduction. A 4-week program of weekly 2-hour group sessions facilitated by a Social Worker, Dietitian and Physiotherapist or Exercise Physiologist was adapted from Appetite for Change (Depart-

ment of Health and Human Services, Tasmania). Following the group program, participants were offered various follow-up options including monthly individual health coaching appointments by telephone or in person with the Dietitian and Social Worker. The clients were able to discontinue at anytime and where discharged when they felt they were 8/10 confident they could continue to self manage their weight loss towards their Healthy Weight Range. Participants completed pre and post group surveys and were contacted by telephone every 6 months regarding stages of change and perceived weight loss. The program was continually evaluated and refined based on feedback questionnaires and focus groups. The evaluation of 12 groups over 2 years is due to be completed in February 2012, at time of writing 8 groups had been completed with a total of 103 enrolments. After the group program, 98% of participants who completed the program had more knowledge about healthy lifestyle choices, at 6 months, 76% reported being in the action or maintenance stage of change, 50% had lost weight, and 30% reported no weight change. At this stage of our research it appears that this approach is successful in creating long-term change, with modest sustained weight reduction in the majority of participants.

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79. THE EFFECT OF DEHYDRATION ON THE BLOOD AND BREATH ALCOHOL RESPONSES TO MODERATE ALCOHOL CONSUMPTION

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Blood (BAC) and breath (BrAC) alcohol concentrations often vary between individuals given the same beverage, and are influenced by factors such as age, gender, ethnicity, body composition, food intake, the dose and type of alcoholic beverage consumed, and the rate of drinking. The impact of dehydration on BAC and BrAC has yet to be investigated. Twelve healthy male participants took part in this study completing 3 trials, in a randomised, single blind, cross over design. Dehydration was induced in one trial through cycling exercise for a target of 2.5% body mass loss. In the other two trials, participants were not required to exercise. Each participant was then provided with a set volume of alcohol, consumed over 10 min in a volume individually calculated to elicit a BAC of ~0.05%. Blood and breath alcohol samples were collected for 4 h following consumption. Participants were also asked to predict their BrAC at each measure. No difference in BAC or BrAC was seen between trials. Breath alcohol concentrations were significantly higher than BACs at 15 min (0.068% vs. 0.046%), 30 min (0.070% vs. 0.054%), 45 min (0.061% vs. 0.051%) and 60 min (0.054% vs. 0.047%) after consumption. This was reversed at measures taken 3 h (0.020% vs. 0.026%) and 4 h (0.005% vs. 0.015%) post ingestion. No difference was observed in the participants' BrAC prediction and actual measures recorded under all trial conditions. Dehydration appears not to influence BAC and BrAC. However, the differences observed between BAC and BrAC highlight the need for better understanding of alcohol intoxication measures.

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113. DIETARY PATTERNS AND BREAST CANCER RISK: A CASE–CONTROL STUDY

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Breast cancer (BC) is the most common type of cancer among Iranian women with an annual age-standardized incidence rate of 18.4 per 100,000. Thus far the association of diet and breast cancer has been mainly addressed using a single-food approach, which does not account for the complex interplay of nutrients within a diet. The aim of this case–control study was to examine the relationship between dietary patterns and breast cancer risk among Iranian women aged 30–65 years. In total, 100 patients with incident breast cancer and 174 age-matched hospital controls were interviewed and usual dietary intakes were collected using a semi-quantitative food frequency questionnaire. In principal component analysis two dietary patterns emerged: "healthy pattern" (vegetables, fruits, low fat dairy, legumes, olive, vegetable oils, fish, organ meat, poultry, pickles, soya, and whole grains) and "unhealthy pattern" (colas, sugar, tea, coffee, potato chips, fried potatoes, salt, sweets, desserts, hydrogenated fats, nuts, commercial fruit juice, refined grains, and red and processed meat). After adjustment for potential confounders, women in the highest tertile of the "healthy dietary pattern" scores, had 66% lower risk of breast cancer compared to those in the lowest (p-trend: 0.01). Being in the highest tertile of the "unhealthy dietary pattern" was positively associated with the breast cancer risk (OR: 5.17, 95% CI: 1.56–17.14, p-trend: 0.01). Our findings suggest that adherence to an "unhealthy dietary pattern" is potentially an unfavourable indicator of breast cancer risk while a diet comprising mainly of plant-based foods may be associated with a reduced risk.

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The remaining abstracts for this session were not decided before publication

Afternoon Concurrent Sessions – Session 11

11.1 Nutrition Informatics

PLENARY: ADVANCING PRACTICE: USING NUTRITION INFORMATION AND TECHNOLOGY TO IMPROVE HEALTH – THE NUTRITION INFORMATICS GLOBAL CHALLENGE

ELAINE J AYRES, LINDSEY B HOGGLE
Abstract not received for publication

11.2 Maternal and Infant Health

381. PRENATAL CARE AND FOOD HABITS OF GUYANESE WOMEN

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Guyana is a developing English speaking country situated on the North-Eastern Coast of South America. This study was undertaken to highlight food habits and prenatal care of women in Guyana to provide insights for Public Health Nutritionists who provide nutrition education to their culturally diverse prenatal clients. One hundred women, who had previously or were currently pregnant, were randomly selected in the Demerara, Berbice and Santa Mission areas of the country. A structured questionnaire was used to collect data and quantifying method was used in the analysis. Results of the survey showed a high percentage of the respondents received prenatal care under modern medical supervision, but some did not. Majority followed old traditions of what to eat during pregnancy with little regard to Fundamental Nutrition Science. Results also showed some respondents' favourite dishes and how they influence prenatal nutrition adequacy. Their favourite beverages primarily were local fruit juices, including locally fermented cassava alcoholic drink called eta during pregnancy. The results of this study would provide valuable contextual knowledge for nutritionists to provide more effective nutrition education and counselling to their ethnically diverse clients in community based programs.

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453. DIETARY PATTERNS AND OTHER POTENTIAL DETERMINANTS OF IRON STATUS IN PREMENOPAUSAL WOMEN LIVING IN NEW ZEALAND

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Previous research has not considered the combined effect of dietary patterns and other factors (e.g. blood loss) on iron status in premenopausal women. This study aimed to identify factors associated with suboptimal iron status in premenopausal women living in Auckland, New Zealand. Women (n = 375) aged 18–44 years participated in this cross-sectional study. Potential determinants of suboptimal iron status (serum ferritin < 20 μg/L) were explored using logistic regression analysis. These included: 'meat and vegetable' and 'dairy' dietary patterns previously identified by factor analysis of an iron food frequency questionnaire; blood loss (menstruation, blood donation, nose bleeds), age, ethnicity, having children, supplement use, oral contraceptive use, history of iron deficiency, and Body Mass Index. Significant predictors of suboptimal iron status included donation of blood either in the past four months (odds ratio (OR) 11.8, 95% confidence interval (CI) 4.3, 33.0) (P < 0.001), or past four to twelve months (OR 4.4, 95% CI 1.4, 13.9) (P = 0.011), being Asian (OR 4.7, 95% CI 2.1, 10.5) (P < 0.001), having children (OR 4.1, 95% CI 2.1, 8.1) (P < 0.001), following either a 'dairy' (OR 1.4, 95% CI 1.0, 1.9) (P = 0.036), or a 'meat and vegetable' (OR 0.6, 95% CI 0.4, 0.8) (P = 0.004) dietary pattern. In addition to dietary patterns characterized by either a low intake of meat and vegetables, or a high intake of dairy products, donating blood in the past year, being of Asian ethnicity and having children increased the risk of, and should be considered when treating women with suboptimal iron status.

Funding source: Massey University Research Fund and New Horizons for Women Trust Research Award

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428. TRANSLATING EVIDENCE INTO PRACTICE TO PROTECT, PROMOTE AND SUPPORT BREASTFEEDING IN QUEENSLAND

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Data from Infant Nutrition Surveys in Queensland in 2003 and 2008 is used to inform breastfeeding strategies. These Computer Assisted Telephone Assisted surveys reveal that whilst most Queensland mothers initiate breastfeeding, duration remains a challenge, especially for younger mothers with lower education or income levels. While breastfeeding rates have increased between survey periods (initiation – 91.8% to 95.3%, breastfeeding at 6 and 12 months – 57% to 59.7 and 31.9% to 33.3% respectively) duration continues to fall short of the national breastfeeding target (80% at 6 months). The most commonly cited (and preventable) barriers to breastfeeding resulting in the lowest mean duration are perceived low milk supply, poor attachment and sore/cracked nipples. Almost half of all mothers who breastfed reported experiencing problems. A suite of resources has been developed to talk openly about the reality of breastfeeding and provide practical information to give mothers the inspiration and confidence to breastfeed for longer. The *breastfeeding and your baby* guides support the *Baby Friendly Health Initiative* antenatal education requirement and the breastfeeding website (http://www.health.qld.gov.au/breastfeeding) is a platform to support the *Queensland Health State-wide Breastfeeding Policy* and the *Queensland Government Work and Breastfeeding Policy*. Monitoring of infant nutrition in Queensland has provided the evidence to successfully advocate for policies and guidelines to provide supportive environments and consistent care for breastfeeding. The survey findings have also been used to formulate targeted strategies to assist health services and families to boost breastfeeding rates. Evaluation of these strategies has provided the evidence for continued funding in this area.

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592. NUTRITION AND EXERCISE INTERVENTIONS FOR CHILDREN AND ADOLESCENTS WITH CHRONIC ILLNESS: A SYSTEMATIC REVIEW

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Children who suffer from chronic illnesses (including cancer) may be at increased risk of long-term conditions such as cardiovascular disease and metabolic syndrome due to their disease and/or its treatment. As the paediatric chronic illness population is unique, information gained from the general population may not be applicable. Diet and exercise interventions may be an important component of the management of chronically ill patients, yet few studies have evaluated the impact of the specific elements contained in these programs. This review aimed to identify common components of efficacious interventions specifically targeting nutrition and physical activity in children and adolescents with chronic illness. Methods: Five databases were searched from 1981 to 2011 for nutrition and exercise interventions developed for oncology, diabetes mellitus, kidney disease, asthma, neurology and juvenile rheumatoid arthritis patients aged 2–18 years. Two independent reviewers assessed 129 abstracts and identified 6 studies meeting the inclusion criteria. Results: From the few formally evaluated nutrition and exercise interventions in paediatric chronic illness, three elements appeared to be common to efficacious programs: (i) early intervention to improve/maintain nutritional status; (ii) involvement of a multidisciplinary clinical team (e.g. dietician, psychologist, health/exercise practitioner); and (iii) regular information/education sessions for positive weight and disease management. Conclusion: This review highlights a paucity of effective nutrition and exercise interventions available for paediatric chronic illness patients. Early nutritional management and education through a multidisciplinary team appears key for disease prevention in this population. Further development of evidenced based nutrition and exercise intervention for children suffering a chronic illness is warranted.

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572. PREDICTORS OF INFANT BIRTH WEIGHT IN WOMEN WITH GESTATIONAL DIABETES MELLITUS

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Gestational diabetes mellitus (GDM) is a recognised cause of large for gestational age (LGA) however the independent effects of other contributing factors to infant birth weight are unclear. We sought to identify predictors of LGA and small for gestational age (SGA) infants in women with GDM. We analysed data held in a computerised database for women with GDM diagnosed by Australian Diabetes in Pregnancy Society criteria, managed by us since 1994. Exclusions: incomplete

data, delivered < 36 weeks gestation and/or last recorded weight > 4 weeks pre-delivery. Data items assessed: pre-pregnancy BMI, total maternal weight gain, weight gain before and after GDM treatment initiation, HbA1c at GDM presentation, therapy (diet or insulin) and ethnicity. Birth weights were categorised as SGA (<10th Centile) and LGA (>90th Centile) using customised percentile charts. Logistical regression analyses were undertaken. Statistical significance: $p < 0.05$. Women who met inclusion criteria (n = 1695) were first seen at a mean ± SD of 28 ± 5 weeks gestation (range 6–39). Ethnic mix was South-East Asian 626 (36.7%), Middle Eastern 467 (27.6%), European 380 (22.4%), Indian/Pakistani 146 (8.6%), Samoan 33 (1.9%), African 25 (1.5%) and Maori 18 (1.1%). Therapy was diet 1172 (69.1%) and insulin 523 (30.9%). Mean total weight gain was 12.3 ± 6.1 kg, the majority (10.6 ± 6.0 kg), gained before dietary intervention. There were 134 (7.9%) SGA and 257 (15.2%) LGA births. Significant independent predictors of LGA infants were: weight-gain before intervention ($p < 0.0001$), pre-pregnancy BMI ($p < 0.0001$), weight-gain after intervention ($p < 0.001$), treatment type ($p < 0.01$), but not HbA1c ($p < 0.06$), and for SGA infants were: weight gain before GDM intervention ($p < 0.005$) and weight gain after GDM intervention ($p < 0.02$). Whilst conventional treatment concentrates on management of blood glucose levels, GDM treatment must include weight management.

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439. COMPLEMENTARY FEEDING OF AUSTRALIAN INFANTS AGED 6–8 MONTHS OLD

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Optimal infant feeding during the transition from milk to a mixed diet has potential to support infant's health at present and later in life. However, it is rarely assessed. This study aims to evaluate infant complementary feeding against recommendations and identify mother and infant's characteristics predictive of compliance with recommendations. One 24-hour diet recall and two 24-hour records were collected for infants 2–7 months who participated in the NOURISH and South Australian Infants Dietary Intake (SAIDI) studies and recruited at maternity wards in South Australia and Brisbane. Food and drink consumption (excluding breast milk and formula) of infants older than 6 months (N = 169, mean age = 6.5 ± 0.5 months) were classified into one of five core and one non-core group as defined by the Australian Guide to Healthy Eating. Recommended intake was defined as consuming foods from the fruit and vegetable groups daily and not consuming non-core foods.

Only 37% (CI = 36.9–37.1) of infants consumed foods from both the fruit and vegetable groups daily and 30% (CI = 29.9–30.1) had non-core foods on at least one day. Multiple logistic regression showed that daily consumption of fruit and vegetables was directly associated with higher maternal age (OR = 4.1) and education (OR = 2.3) and older age of introduction of solids (OR = 3.3). Consuming non-core foods was directly associated with higher birth order (OR = 2) and lower Socioeconomic Indexes for Areas (OR = 3.6).

This analysis indicates the need for improvements in healthy infant feeding to meet recommendations and informs targeted interventions.

Funding source: Grant from NHMRC (426704), SA Health, Food Standard of Australia and New Zealand, MLA, Heinz

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844. MATERNAL DIETARY OMEGA-3 PUFA INTAKES, FOOD SOURCES AND COMPARISON TO RECOMMENDED INTAKES

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Omega-3 polyunsaturated fatty acids (n-3 PUFA) are important for health especially during pregnancy and for the growing fetus. Little is known about maternal intakes, food sources and whether or not they're meeting recommended intakes. The aims of this study were to determine the median dietary intakes (inter-quartile range) and food sources of EPA, DPA, DHA and total long chain (LC) n-3 PUFA in a subset of pregnant women from the DOMInO trial; and to determine if intakes from foods met recommended DHA intakes of 200 mg per day. The DOMInO trial was a multi-centre, randomised placebo controlled trial (Makrides *et al.* 2010). A subset of women (n = 92) from the Campbelltown cohort was asked to complete a validated PUFA questionnaire (Swierk *et al.* 2010) which automatically estimates n-3 PUFA intakes and their respective food sources. Pregnant women consumed 75 mg (46–132) EPA, 77 mg (50–123) DPA, 65 mg (44–130) DHA and 237 mg (165–368) total LC n-3 PUFA with no significant differences between the control and DHA groups. Even though fish and seafood is the richest source of LC n-3 PUFA, especially DHA, meat contributed twice as much LC n-3 PUFA than fish and seafood. One woman did not consume any LC n-3 PUFA and only 12 women (13%) met the recommended DHA intakes. Despite low DHA intakes, the cord blood levels in the control group were relatively high (Makrides *et al.* 2010). The majority (87%) of pregnant women did not meet the recommended DHA intakes probably due to low intakes of fish and seafood.

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11.3 Clinical Nutrition

585. THE DEVELOPMENT AND EVALUATION OF A NOVEL NUTRITION EDUCATION TOOL FOR USE WITH EATING DISORDER PATIENTS

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Dietetic intervention is an essential component of the multidisciplinary management of eating disorder patients, however, few dietetic educational aids are available for this patient population, and little evidence is available to support many aspects of practise in this area (Hart *et al.*, 2011). This research aimed to design and qualitatively investigate the effectiveness of a nutrition education tool for promoting healthy eating and "normalising" eating attitudes in people with eating disorders. Clinical experience with this patient population was used to develop a nutrition education tool: the Eating Disorders Healthy Eating Pyramid ("ED-Pyramid"). Twenty eating disorder patients participated in two nutrition education sessions, one using the Australian Guide to Healthy Eating ("Australian Guide") and another using the ED-Pyramid. Following each session, participants engaged in a guided discussion about the nutrition messages of the education tool, and completed a questionnaire on eating attitudes promoted by that tool. Nineteen participants preferred the ED-Pyramid. Both tools were reported to promote dietary variety, but the Australian Guide also promoted avoiding high calorie foods and fats/oils, which is inconsistent with the nutritional needs of

eating disordered patients. Questionnaire responses about the ED-Pyramid suggested appropriate dietary recommendations were conveyed, and maladaptive nutrition beliefs were challenged by this tool. These outcomes suggest the ED-Pyramid may be an effective educational tool for eating disorder patients, while the Australian Guide may reinforce some maladaptive attitudes, beliefs and avoidant behaviours, and may not be suitable for use with this clinical population.

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131. ABNORMAL INTESTINAL HANDLING OF SORBITOL AND MANNITOL IN PATIENTS WITH IBS: POTENTIAL CLINICAL IMPLICATIONS

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Sorbitol and mannitol are polyol isomers widely distributed in food. Major dietary sources include stone fruits and pears (Sorbitol), cauliflower and mushrooms (mannitol). Whilst sorbitol is poorly absorbed and induces symptoms in patients with Irritable Bowel Syndrome (IBS), the gastrointestinal effects of mannitol are unknown. We aimed to compare the absorption and symptom response of sorbitol and mannitol in patients with IBS and in healthy individuals. A randomised, double-blinded, placebo-controlled, crossover study was conducted in 20 IBS subjects (Rome III) and 21 healthy controls. Subjects were challenged on separate occasions in randomised order with 10 g of either sorbitol, mannitol or glucose (as control) in 100 ml solutions and responses measured in 4-h breath hydrogen tests. Gastrointestinal symptoms during the tests were assessed using visual analogue scales. Similar proportions of healthy (67%) and IBS subjects (60%) had sorbitol malabsorption, but fewer subjects with IBS malabsorbed mannitol (20% vs 57%; $p = 0.02$). Majority of healthy subjects (86%) had either concurrent malabsorption or absorption of both polyols. In contrast, 40% of IBS patients were discordant for sorbitol and mannitol malabsorption, with less than 20% malabsorbing both. Symptoms increased significantly after both polyols compared with the placebo glucose ($p \leq 0.05$) in IBS only, but were independent of their malabsorption. In conclusion, discordant absorption of sorbitol and mannitol occurred in patients with IBS compared to that in healthy individuals, with sorbitol more likely being malabsorbed. Polyols induce symptoms in IBS independently of their malabsorption, implying dietary restriction of polyols are warranted, irrespective of the individual's absorptive capacity.

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238. DIETARY HABITS OF CHILD CANCER SURVIVORS

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Childhood cancer survivors (CCS) are at increased risk of obesity, diabetes, osteoporosis and cardiovascular disease in adulthood. However, little is known about the dietary habits of young cancer survivors. This study investigated dietary intake and parental views about CCS intake during and shortly after cancer treatment. The parents of 50 CCS who were less than 13 years old and had completed treatment in the previous 5 years completed 3-day food records. Using Foodworks software and reduced rank regression the food records were analysed for dietary patterns. A sub-set of 18 parents participated in semi-structured telephone interviews which were analysed using the qualitative framework of Miles and Huberman. The food diaries showed an inadequate fruit and vegetable intake and a large intake of high fat and sugar foods. Data collected through the qualitative parent interviews confirmed these results and suggested an important change in their child's dietary habits compared with habits prior to diagnosis. Parents reported that young CCSs consumed larger portions of high fat/high sugar and refined convenience foods, and had a reduction in fruit and vegetable intake. Parents also described a sense of regret, feeling that they should have been more proactive in encouraging consumption of healthier foods during treatment (when they were primarily concerned about their child's weight loss). The results from this study provide insights into the dietary habits of CCS. This study highlights key areas for preventative dietary interventions which may help to decrease the risk of late effects in adult survivors of childhood cancer.

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71. PARTICIPATION IN A STRUCTURED WEIGHT LOSS PROGRAM IMPROVES SURVIVAL IN OBESE PATIENTS WITH CHRONIC KIDNEY DISEASE

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Obesity is increasingly prevalent in patients with chronic kidney disease (CKD), and contributes to declining kidney function. Weight loss of 8% is achieved and maintained up to 2 years in our renal weight management programme (WMP) (MacLaughlin *et al.*, 2010), yet its effect on mortality and cardiovascular morbidity is unknown. This study aimed to elicit the effect of participation in the WMP on all-cause mortality and cardiovascular morbidity in obese patients with CKD. The WMP is a 12-month structured program of low-fat, energy-reduced diet, exercise, orlistat (Xenical, Roche Ltd) and behavioural therapy, delivered by a dietitian and physiotherapist. The primary outcome was time to a combined event of all cause mortality, myocardial infarction, stroke, or hospitalisation for congestive heart failure. From 2005 to 2009, 172 obese patients with CKD commenced the WMP and 176 declined – becoming the observational control group (CON). Baseline (mean ± SD) age (52.8 ± 12.7 years), BMI (36.2 ± 5.4 kg/m^2), estimated kidney function (35.8 ± 25.9 ml/min/1.73 m^2), gender and ethnicity were equivalent between groups, although CON included more patients with diabetes than WMP (57% vs 43%, $p = 0.03$). Kaplan Meier survival analysis with log rank test differed between groups ($p = 0.02$). Cox regression analysis with adjustment for diabetes, age, treatment modality, gender and ethnicity indicated that patients in WMP were less likely to have a shorter time to combined event than those in CON (HR 0.55, 95% CI 0.32–0.95), indicating that participation in a structured weight loss program may be associated with improved survival in obese patients with CKD.

Funding source: Research grant from King's College Hospital NHS Foundation Trust, UK

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799. PREOPERATIVE IMMUNONUTRITION AND ITS EFFECT ON POSTOPERATIVE OUTCOMES IN GASTROINTESTINAL SURGERY PATIENTS: A RANDOMISED CONTROL TRIAL

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Invasive procedures such as major surgery cause immune suppression, leading to an increased risk of post-operative complications, infections and extended hospital stay. Recent research has focused on the use of

immune-enhancing nutrition supplements and their ability to decrease post-operative complications and reduce treatment costs. This prospective randomised controlled trial aims to examine the effect of pre-operative immunonutrition supplementation on post-operative length of stay and complications. Ninety-five patients scheduled to undergo elective upper and lower gastrointestinal surgery were recruited. The treatment group (n = 46) received a commercial immuno-enhancing nutritional supplement in the five days pre-operatively. The control group (n = 49) received no nutritional supplements. Standard post-operative management followed for all patients with treating teams blinded to patient group allocation. Primary outcome measure was length of hospital stay, with secondary outcome measures of infectious and non-infectious complications, unexpected intensive care admission and mortality. Length of stay for the treatment group was 1.7 days shorter than the control group (7.0 ± 4.1 and 8.7 ± 6.5 days; P = 0.14). However considering malnourished patients only, those in the treatment group had their hospital stay reduced by 3.1 days (8.3 ± 3.5 vs 11.4 ± 9.2 days; P = 0.30). Complication and intensive care admission rates were reduced in the treatment group (14 vs 8 for complications and 3 vs 2 intensive care admissions within the control and treatment groups respectively), however not statistically significant. Pre-operative immunonutrition therapy has the ability to reduce length of stay in patients undergoing gastrointestinal surgery, with greater treatment benefits seen in malnourished patients; however, greater patient numbers are required to show significance.

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The remaining abstract for this session was not decided before publication

11.4 Micronutrients and Health 2
LEAD SESSION: SODIUM REDUCTION AND THE PREVENTION OF CHRONIC DISEASE

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Diets high in dietary sodium (salt) raise blood pressure and contribute to increased cardiovascular risk that raise blood pressure and adversely affect vascular function and cardiac hypertrophy. The cardiovascular benefits of reduced salt intake are on par with the benefits of population-wide reductions in tobacco use, obesity, & reductions in serum cholesterol. In Australia we now have data on total daily dietary sodium intake, as estimated by gold standard 24-h urine collections. In 546 adults, with mean age 56.3 (12.3) (SD) years, comprising of 300 women and 246 men, the mean estimate of daily salt equivalents was men: 9.5 (3.1) g/day and women: 6.9 (3.5) g/day. In a sample of 238 children aged 5–13 years, 120 boys and 118 girls with a mean age of 9.8 (1.7) years, the average 24-h urinary salt equivalent excretion was 6.0 (2.5) g/day. Ninety-seven percent of men and 86% of women adults exceeded the Suggested Dietary Target for sodium and 69% of children exceeded the daily Upper Limit for sodium. This data indicates that both adults and particularly children are consuming too much sodium/salt. More than 75% of our dietary sodium comes from manufactured foods; therefore we urgently need to significantly reduce the amount of salt added to manufactured foods by setting clear reduced sodium content targets for all manufactured foods. Product reformulation of lower sodium food products should be coupled with educational strategies to raise awareness of the adverse effects on health of the high intake of dietary sodium at all ages in the population.

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629. FERRITIN, BODY IRON STORES, CRP AND AGP IN ANAEMIC SCHOOLCHILDREN IN BANTUL, YOGYAKARTA, INDONESIA

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Anaemia is a major public health problem worldwide. Biomarkers of inflammation have been shown to affect certain micronutrient measures, including haemoglobin, the primary indicator of anaemia status. The aim of the study was to determine the values of several haematological markers, such as ferritin, body iron stores, C-reactive protein (CRP) and α-(1)-acid glycoprotein (AGP) in order to define the presence of anaemia in children. This study was *cross-sectional* design, in 336 children of primary school aged 10–11 years. The subjects were divided according to WHO criteria for anaemia (haemoglobin < 11.5 g/dL) into two groups: with and those without anaemia. Result: the prevalence of anaemia in this population was 5%. Moreover, as compared with non-anaemic children, anaemic children had lower ferritin (27.95 vs 42.69 μg/L), body iron stores (3.49 vs 5.31 mg/kg body weight), and CRP (0.49 vs 0.58 mg/L). The AGP was higher in anaemic children than in non-anaemic children (0.67 g/L vs 0.64 g/L). Using t-test, we observed significant differences in the values of ferritin and body iron stores between the group of anaemic and non-anaemic children ($p < 0.05$), but there was no significant differences in the values of CRP and AGP between those groups ($p > 0.05$). Non-anaemic children have higher ferritin and iron body stores than anaemic children. Conclusion: anaemia status in this population is not related to the infection, because of the lower CRP in anaemic children. The use of CRP and AGP as an indicator of anaemia may be limited in children without inflammation and infection.

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588. STUDIES ON EFFECTIVENESS OF NAFEEDTA ON CASSAVA COOKIES TO CONTROLLING IRON DEFICIENCY ANAEMIA: A POPULATION RANDOMIZED CONTROL TRIAL IN INDONESIA

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Fortification of food materials into a product is expected to be an alternative in improving food quality in terms of nutritional value and be able to reduce various disease. Regard to research, we made biscuit from cassava flour and added with iron (Fe) in the form NaFeEDTA, which is recommended for high-phytate food like cassava. It is expected that cassava flour biscuit can contribute more in suppressing iron anaemia, in a simple way. The aimed of these research was to investigate the effectiveness of cassava cookies fortification with NaFeEDTA on population at high risk for iron deficiency. The study was randomized, double-blinded, controlled trial. The subjects in the fortified group were given iron-fortified cassava cookies in form NaFeEDTA and Fe_2SO_4, whereas those in the control group were given cookies from wheat flour that fortified by the industries. The intervention was continued for 3 months. Children were randomly assigned to 1 of 3 treatment groups: cassava cookies fortified with NaFeEDTA, cassava cookies fortified with Fe_2SO_4, or cookies fortified with the industries (control group). Cookies were administered by caretakers once weekly. Food intake was monitored with 24-h recalls for 7 times. Sociodemographic characteristics did not differ significantly between group. Baseline characteristics, including haemoglobin concentration and nutritional intake were similar in the 3 treatment groups. After intervention, mean haemoglobin levels were significantly higher in fortified group with NaFeEDTA than in control group, and statistically significant ($p < 0.05$) Cassava Biscuit fortified with NaFeEDTA effective to combat anaemia in school age children.

594. THE RELATIONSHIP BETWEEN SPATIAL MEMORY AND THE THICKNESS OF HIPPOCAMPAL CA1 PYRAMIDAL LAYER IN STRESS-INDUCED RATS (RATTUS NORVEGICUS) AFTER CENTELLA ASIATICA LEAF EXTRACT'S ADMINISTRATION

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Previous studies have shown neuroprotective effects of *Centella asiatica* (CeA). Chronic stress may cause deficit in the hippocampal function and alter hippocampal structure. The study is to investigate the relationship between memory and the thickness of CA1 hippocampus in stress-induced rat after CeA administration. Eight-week male rats (n = 21) were divided randomly into three groups, i.e. two treatment groups given 150 (KP1) or 300 mg/kg BW (KP2) of CeA extract and one control group received 1 mL aquadest (KN). An eight-armed radial maze's test was conducted to assess rat's performance. After an electrical stress and CeA administration is conducted, the histological preparation was performed. The results showed that the mean of percentage of entering right arm in maze test after treatment of KN, KP1, and KP2 are 11.02%; 53.33%; and 35.26% respectively. The thicknesses of CA1 pyramidal layer (μm) are 2,702; 4,441 and 5,588, respectively. There was significant difference of spatial memory and the thicknesses of CA1 pyramidal layer between groups ($p < 0.05$). Treatment with CeA extract is able to enhance spatial memory and increase the thickness of hippocampal CA1 pyramidal layer after induced by electrical stress.

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791. VITAMIN D STATUS IN PREGNANT MOTHERS AND THEIR INFANTS: A NUTRITIONAL EVALUATION

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This study was conducted to determine the vitamin D status of pregnant Indian women and its association with that of the infants. Subjects were recruited from Armed Forces Clinic, New Delhi. 541 healthy women with uncomplicated, single, intra-uterine gestation reporting in any trimester were consecutively recruited [summers (April–October): 299, 1st trimester, 97; 2nd trimester, 125; 3rd trimester, 77 and winters (November–March): 242, 1st trimester, 59, 2nd trimester, 93; 3rd trimester, 90] and 100 controls (Non Pregnant Non Lactating). 342 mother–infant pairs were re-evaluated 6 weeks postpartum. The mean age of pregnant women was 24.6 ± 2.8 years (19–30 years). 96% pregnant women were vitamin D deficient [25(OH) D < 20 ng/ml], with 36.7%, 41.7% and 17.7% falling in the mild (10–20 ng/ml), moderate (5–10 ng/ml) and severe (<5 ng/ml) hypovitaminosis D categories respectively. Significant negative co-relation was observed between maternal vitamin D and iPTH levels ($r = –0.317$, $p = 0.001$) and vitamin D and ALP ($r = –0.23$; $p < 0.00$). At 6 weeks, 99.7% infants had hypovitaminosis D, with 19.3%, 51.2%, and 29.2% in mild, moderate and severe categories respectively. A significant negative correlation was obtained between 25(OH) D and iPTH in both mothers ($r = –0.310$, $p = 0.0001$) and infants ($r = –0.56$, $p = 0.0001$). A positive correlation was found between mothers and infant 25(OH) D ($r = 0.779$, $p = 0.0001$), ionized Ca ($r = 0.166$, $p = 0.0001$) and iPTH ($r = 0.534$, $p = 0.0001$) levels. Hence, ensuring a good vitamin D status of pregnant women is essential to promoting bone health in infancy.

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874. THE EFFECTS OF NON-ANAEMIC IRON DEFICIENCY ON COGNITIVE FUNCTIONING: A DOUBLE-BLINDED, PLACEBO CONTROLLED TRIAL OF IRON SUPPLEMENTATION IN WOMEN OF CHILDBEARING. A STUDY ON ACCEPTABILITY AND FEASIBILITY

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Evidence suggests iron deficiency affects cognitive functioning in children and may affect women of childbearing age; however, there is no consistent evidence to date. The aim is to examine the suitability of the IntegNeuro battery of tests for assessing cognitive function in iron deficient and iron sufficient women and to determine an appropriate sample size for an RCT. Also, to determine an efficacious iron dosage to improve the iron status of iron deficient participants, while maintaining blinding to treatment. A double-blinded, placebo-controlled RCT pilot was conducted in females of child-bearing age (18–35 years). Cognitive functioning and serum iron status were assessed. Iron deficient participants were randomised to receive placebo, 60 mg or 80 mg elemental iron. Currently, 60 participants have been recruited, of these, 37% have non-anaemic iron deficiency, which is consistent with Australian data. At baseline, participants with non-anaemic iron deficiency achieved lower short term memory scores (as measured by digit span tasks) than those with normal iron status ($p = 0.05$, $p = 0.01$). This early trend will be re-evaluated with the final, larger sample size in mid-2012. The IntegNeuro battery of tests with computer touch-screen is simple to administer and well accepted by women aged 18–35 years. In conclusion, current data indicates rates of iron deficiency are consistent with Australian data and suggests a relationship is present between iron status and cognitive function as measured by digit span. Final results are expected to provide us with data to inform future sample size for larger RCT.

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11.5 Dietetics Education 2

963. SUCCESSFUL INTEGRATION OF NUTRIGENOMICS INTO NUTRITION SCIENCE COURSES: TEACHING FOR THE FUTURE, TODAY

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Rapid advances in genomics technology have significantly broadened information about cellular nutrient/gene interactions and human metabolism. Future (and current) nutrition and dietetics professionals need an understanding of this innovative field and modern therapeutic approaches. From July – November 2011, nutrigenomics content was integrated into the Nutrition Science curriculum at The University of Queensland. Students from this program may continue into Dietetics degrees. Material on: (i) nuclear receptors; (ii) whole genome microarrays; (iii) epigenetics; (iv) single nucleotide polymorphisms (SNPs) and (v) ethical issues around genetics testing was delivered through lectures and tutorials. Groups of students gave tutorial presentations on a range of gene/nutrient interactions after critically reviewing the scientific evidence. The aim of this collaborative learning method was to enhance students' understanding of the material presented in a student-led format. There was a 91% response rate (n = 64). Paired t-tests indicated student knowledge and confidence relating to nuclear receptors, SNPs and ethical issues significantly improved ($p < 0.05$). Perceived competence improved for five out of eight course objectives ($p < 0.05$), including those for nutrigenomics. Thematic analysis indicated peer interaction and teamwork was enjoyable and the content was interesting and engaging. The course was perceived as challenging due to "*the development of nutrition as a science*," demonstrating significant insight. Nutrig-

enomics can be successfully integrated into nutrition science curriculums with minimal disruption, high levels of student satisfaction and achievement. The weighting of the assessment piece will be increased to 15 per cent for 2012 and marks will be awarded for attendance at classmates' presentations, based on student feedback.

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997. NEW WAYS TO PREPARE DIETETICS PROFESSIONALS; MAINTAINING SKILL AND QUALITY WHILE INCREASING CLASS SIZE

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The University of Queensland commenced an innovative Master of Dietetic Studies Program in 2009, running theory and practice concurrently and utilising adult learning principles to foster critical thinking. The key clinical courses, Medical Nutrition Therapy 1 and 2 consist of weekly case study workshops and pre-readings. Due to increased student numbers with the same teaching load, effective teaching and communication methods are required. The aim of this education intervention was to determine student satisfaction and acceptability with online multiple choice quizzes and Discussion Board. Qualitatively, thematic analysis was used to identify, analyse and report key themes from the open-ended questions of the student survey (N = 24). Likert scales ranking from 1 (strongly disagree) to 5 (strongly agree) were also used. Data highlighted that the benefits of online quizzes fell into two main sub-themes: (1) encouraged student completion of pre-readings which helped students work through the case studies; and (2) encouraging revision of materials. Most students felt that the online quizzes helped them to be an active participant in their learning process (mean 4.13) and almost all students wanted to continue to use the online quizzes (mean 4.70). The Discussion Board was not well utilised as students felt that the weekly communication with staff and other students was sufficient. Future refinements will include expanding the online multiple choice question pool and to investigate whether students would like a less structured communication forum such as a self-moderated Facebook site.

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886. ENHANCEMENT OF DIETARY CARE IN HEALTH CARE INSTITUTIONS IN FRANCE

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The objective is to describe and evaluate the impact of health policies implemented in France to reduce the prevalence of nutritional diseases. In France there are 14.5% of obese adults, 3.5% of obese children and 30 to 60% of undernourished people. Health policies (Hospital Patient Health and Territory law, National Nutrition Health Plan, Obesity Plan) thus encourage the health care institutions (HCI) to modify the offer of nutritional care by reorganizing their activity of clinical nutrition by the establishment of Committees of Connection Food Nutrition (CLAN) and of Transverse Units of Clinical Nutrition (UTNC), while referring to the recommendations of clinical practices of the High Authority in Health. The ministry for health worked out Indicators for the Improvement of Quality and the Safety of Care (IPAQSS) for the evaluation of these health policies. In 2008, 73% of HCI have developed CLAN and 2% of HCI created a UTNC. IPAQSS specific indicators of nutritional disorders (weight, body mass index, weight change, dietary advice) increased by 40% to 60% between 2008 and 2010. Coding of malnutrition was also significantly increased and codification by a letter «key» acts of diet was initiated in many HCI. The implementation of health policies was a real strategic leverage to optimize the tracking and the multidisciplinary management of nutritional disorders with medicalization, coding and traceability of dietary treatment.

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231. TRANSFORMING THE DIETETIC EDUCATION MODEL TO MEET DEMAND FOR DIETITIANS

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Ontario has the lowest per capita number of dietitians in Canada. Although there are nutrition and food graduates being educated, access to fieldwork positions required for licensure is limited. Healthcare programs and services, and the role of the dietitian are evolving as chronic disease and an aging population increase demand on the system. To address the shortage of fieldwork positions and evolving practice demands, a task force proposed a new dietetic education and training model. The task force explored academic and fieldwork education models for health professions and proposed a model of dietetic education that ensures: all qualified students have access to required fieldwork education; participation of existing fieldwork sites; and fiscal responsibility and accountability. The new dietetic education model better serves the needs of learners, preceptors and consumers, while optimizing the use of resources and enhancing the profession. This session will be of interest to others contemplating dietetic education program change. It will focus on a stakeholder driven process and describe a model that aligns academic and fieldwork programs based on a blended theoretic and applied curriculum, centralized placement support and a collaborative governance structure.

Funding source: Ontario Ministry of Health and Long-Term Care

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The abstract for this session was not decided before publication

471. SELF ASSESSMENT OF NUTRITION STUDENT'S PERFORMANCE WITH PROBLEM BASED LEARNING IN COMPETENCY BASED CURRICULUM

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Competency based Curriculum (CBC) was implemented using hybrid approach in Nutrition Department. Problem Based Learning (PBL) is one kind of approach and an innovative instructional method with problem solving process. The objective of study was to assess improvement of nutrition student's performance with PBL using self reporting. This method were 50 students with PBL experience (class 3th) and 34 students with PBL experience (class 4th) and supervised practice were asked to fill out a questionnaire on benefit and perception of PBL to student's performance. Comparison of both classes analysed using Kolmogorov Smirnov test. The findings were almost all students of both classes informed that PBL approach can improve knowledge, ability of communication, motivation to learning, self confidence, critical thinking, problem solving skill, and cooperation skill. Students in supervised practice stage also informed that PBL support them to do all assignment

and in achieve indicator of competencies. No difference of all performance both classes. Some students informed that PBL need more time for preparing and independent learning. Finally, conclusion was PBL approach is good in CBC for improving soft skill of student and support for students to improving ability of critical thinking and problem solving skill in supervised practice.

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1032. THE CANADIAN FOUNDATION FOR DIETETIC RESEARCH: 20 YEARS OF SUPPORT FOR PRACTICE-BASED RESEARCH

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In 1991, the Canadian Foundation for Dietetic Research (CFDR) was established as a charitable foundation. CFDR attracts financial support from corporate partners and Dietitians of Canada (DC) members, and disperses funds through an annual competitive grants program. The aim was to review research funding activity and grant recipient perspectives of CFDR at the time of the 20th Anniversary. CFDR records were reviewed. Principal investigators who received CFDR sponsored research funding in the past 20 years, and who could be contacted by e-mail, were invited to describe the impact that CFDR support has had for them. In 1993, two grants worth $5,000 each were dispersed. Since that time, 108 research projects have been supported, and more than 1.2 million dollars granted. Grants have addressed research areas in clinical, public health, food science, food management and professional practice. Investigators valued the support of CFDR in enhancing evidence-based practice through quality research. CFDR support of pilot work, practice-specific questions, novel research areas or approaches, filled a gap in research funding. Grants indirectly supported dietetic research training, the profile of dietitians and subsequent funding success. There have been numerous peer reviewed publications. Having reached its 20th year milestone, CFDR has created a legacy in enhancing the health of Canadians by contributing new knowledge about food and nutrition through its funding and disseminating of applied nutrition and dietetic practice research.

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11.6 Behaviour Change

989. USE OF MOTIVATIONAL ENHANCEMENT THERAPY IN A DIETITIAN-LED INTERVENTION RESULTS IN DECREASED ENERGY AND FAT INTAKE: BEHAVIOUR CHANGE RESULTS FROM THE 40-SOMETHING RCT

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Behaviour change theories provide a framework for evidence based dietetic counselling strategies. The 40-Something RCT (ACTRN12611000064909) aimed to determine whether a dietitian-led intervention using motivational enhancement therapy would result in changes to the secondary outcome measures of decreased energy intake and increased physical activity in non-obese (BMI = 18.5–29.9 kg/m^2) 44–50 year old premenopausal women. Women were randomly allocated to a structured intervention (SI) group (n = 28) (4 Dietitian consultations and 1 Exercise Physiologist consultation over 12 months) or a self-directed intervention (SDI) group (n = 26) (written information only). Participants completed 4-day weighed food and physical activity diaries at baseline (n = 53), and 12 months post-intervention (n = 35) in November 2011. Paired t-tests were used to compare within-group changes. The mean (SD) dietary intake of the SI group changed significantly over the 12 months, with decreases in energy intake (7907 (1610) kJ to 6786 (2085) kJ, p = 0.037); total fat (64.0 (20.4) to 50.4 (15.9), p = 0.041); saturated fat (24.6 (10.1) to 18.7 (6.3), p = 0.033); while levels of protein, calcium, iron, zinc and iodine were maintained. No significant changes were observed for the SDI group. Change in physical activity and sedentary behaviours (pedometer steps, total activity and sitting time) were not achieved by either group. The study demonstrates the efficacy of using a dietitian-led intervention to change dietary intake behaviour in a relatively brief intervention. However, the lack of a significant increase in physical activity means that more attention should be placed on skill development in this area in future versions of the intervention.

Funding source: University of Newcastle. C. Collins is supported by an NHMRC Career Development Fellowship

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817. EVALUATION OF AN EARLY ANTENATAL HEALTH PROMOTION WORKSHOP FOR IMPROVING MATERNAL HEALTH BEHAVIOURS: THE HEALTHY START TO PREGNANCY WORKSHOP RCT

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Pregnancy is an ideal time to encourage healthy lifestyles as most women are in contact with the health service and are more receptive to health messages; however few effective models of care exist. An early pregnancy workshop was developed to influence key behaviours with demonstrated health outcomes. Group effectiveness was evaluated using an randomised controlled trial; control women (n = 182) received a nutrition resource at their first antenatal clinic visit and intervention women received the resource and attended a 1-hour 'Healthy Start to Pregnancy' workshop (n = 178). Fruit and vegetable intake, diet quality, physical activity, smoking cessation, weight gain knowledge, and intention to breastfeed were assessed at service-entry and 12 weeks later. Intention-to-treat (ITT) and per-protocol (PP) analyses examined change in behaviours over time between groups. No significant differences existed between the groups at baseline on demographic or behavioural measures. Half (48.3%) of intervention women attended the workshop. Survey 2 response rate was 67.2%. Overall, significantly more women in the intervention met pregnancy fruit guidelines (p = 0.011) (ITT). Women who attended the workshop consumed significantly more serves of fruit (p = 0.004), vegetables (p = 0.006), met fruit guidelines (p < 0.001), had higher diet quality (p = 0.027) and clinically significant increases in physical activity levels (p = 0.47) compared with those who only received the resource (PP). Attendance at the Healthy Start to Pregnancy workshop results in improvements in important pregnancy health behaviours. Further investigation to inform service changes is required to facilitate women's workshop attendance.

Funding source: Grant from the JP Kelly Foundation, Mater Health Services

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964. BOUNCING BACK TO YOUR PRE-BABY BODY: A RCT TO REDUCE POSTPARTUM WEIGHT GAIN

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Approximately 35% of pregnant Australian women are overweight or obese with adult weight gain attributed to childbearing. However, pregnant women are self-motivated to improve lifestyles. This creates an ideal educational opportunity to infuse lifelong healthy habits. Our aim was to conduct a randomised controlled trial (RCT) comparing a self-directed weight management program for lactating women versus wait-list controls. Women with a pre-pregnancy BMI 25–35 kg/m^2 were recruited during pregnancy from John Hunter Hospital and randomised to Control or weight management (WM) groups. WM participants received a weight management program at 35 weeks gestation to implement post-partum, based on Social Cognitive Behaviour theory and designed to help women set goals, gain organisational skills for food preparation and self-monitor intake and exercise, with an energy allowance with healthy snack ideas for lactation. Participants received a digital video disc (DVD), booklet, lunchbox, dinner plate portion disc. Participants were encouraged to become familiar with the program before they delivered. Control participants received the program three months postpartum. For all participants (n = 19), mean ± standard deviation gestational weight gain was 13.8 ± 6.9 kg and weight retention at three months was 4.7 ± 7.9 kg. There was no significant difference in gestational weight gain between WM (n = 12) and Control groups (n = 7). At three months postpartum, Control participants retained 9.0 ± 4.4 kg while WM participant retained 0.3 ± 8.5 kg (p = 0.04). Overweight and obese women receiving a weight management program during pregnancy have significantly better short term postpartum weight outcomes compared to those receiving no education.

Funding source: Internal grant from the University of Newcastle. C Collins is supported by a National Health and Medical Research Council Career Development Award

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229. WHAT FACTORS ARE ASSOCIATED WITH THE NUMBER OF CONSULTATIONS PER DIETETIC TREATMENT

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Little is known about the costs and effectiveness of dietetic healthcare. In order to study these effects, it is important to increase transparency in dietetic treatment, for example by comparing consultation sessions. This study examined variation and explored variables that were associated with the number of consultations per treatment. Data were used from the National Information Service for Allied Health Care (LiPZ). LiPZ is a Dutch registration network of allied healthcare professionals, including primary healthcare working dietitians. Data were used from 6,496 patients who underwent dietetic treatment between 2006 and 2009, treated by 27 dietitians working in private practices. Data collection was based on the long-term computerized registration of healthcare-related information on patients, reimbursement, treatment and health problems. Poisson multilevel regression analyses were used to model consultation sessions and to account for the clustered data structure. Adjusted for patients' demographics, therapy-related and health-related factors, the mean number of consultations was 4.9 and varied between dietitians with a 95% coverage interval from 2.3 to 10.1 consultations per treatment. Certain groups of patients used significantly (p < 0.05) more dietetic healthcare compared to others. These were older patients, females, the native Dutch, patients with a history of dietetic healthcare, patients who started the treatment on their own initiative, and patients with psychiatric problems, multiple diagnoses, overweight, or binge eating disorder. Most of the variation in consultation sessions was found to be due to patient-related factors. However, considerable variation was caused by dietitians. More research is necessary to examine factors that explain this variation.

Funding source: The Dutch Ministry of Health Welfare and Sport

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513. IMPROVED WEIGHT MANAGEMENT IN PRIMARY CARE

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This program aimed to develop a flexible population-based planning framework for the Canadian inter-professional primary care organizations to deal with obesity management. Three relevant planning models/frameworks were used to organize the work: the Chronic Care Model of Wagner, the WHO planning framework for prevention of chronic disease (2005), and the MRC (UK) guide to developing and evaluating complex interventions (2008). A scoping review (2003–2009) was completed to identify evidence of improved obesity management in primary care in the literature. In the second phase 11 focus groups with providers and patients were conducted and transcripts thematically analysed for ideas on new services. The final phase was review by several provider teams and a national panel. Five target groups were identified for planning purposes: pregnancy to 2 years, 3–12 years, 13–18 years, 18+ at risk or with health conditions and 18+ with complex care needs. Of the 176 intervention studies, 81% were directed to diabetes and/or cardiovascular diseases. The most promising strategies included intensive skills training with patients, case management, provider education and additional provider tools such as treatment algorithms and access to specialist expertise. Strategies from the focus groups were grouped under themes for: raising awareness, screening, clinical care, skill building, ongoing support, and social/peer support. Providers emphasized the need to address socio-economic and mental health issues across all target groups. The development of the framework has been informed by both evidence and opinion, and is designed to be used at the organization level to develop services.

Funding source: Canadian Institutes for Health Research

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467. IMPROVING THE QUALITY OF DIETETIC CONSULTATIONS

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Consultations are the main vehicle through which health care professionals (HCP) inform educate and facilitate patient's involvement in their daily management. Good communication skills are required to facilitate this process. However, HCP's have been shown to have distorted perceptions of their communication skills (Parkin & Skinner, 2003). The patient's ability to recall decisions made at the end of the consultation can indicate active listening and interaction with the HCP (Heisler *et al.*, 2003). Could the measure of agreement on reported decisions made by both the client and the dietitian be a clinically relevant marker? To test this hypothesis 86 consultations involving four

dietitians were analysed, agreement on reported decisions made was 44% but varied significantly between dietitians ($p = 0.002$). Mean agreement on reported decisions made was 1.65 (SEM 0.11) per consultation. A minimum consultation time of 18.27 and 23.33 minutes for follow-up and new patient appointments respectively was found to be needed before improved agreement on reported decisions occurred. The amount and immediacy of training undertaken in behaviour change/communication skills was associated with improved agreement on reported decisions. Demonstrating the fitness of this marker as an outcome measure has provided insight into the behaviours, skills and patterns of consultations which promote interaction between dietitians and patients. It has also highlighted the importance of regular training and assessment of communication skills in practice and raised a further question – *how long does a dietetic consultation need to be in order to be effective?*

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1035. OBESITY PREVENTION BEHAVIOUR AND ENVIRONMENT RELATIONSHIPS ON U.S. POST-SECONDARY CAMPUSES

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U.S. post-secondary institutions (n = 14) were assessed for the healthfulness of the campus eating and walk/bike-ability environment and indicators of student health using the PRECEDE-PROCEED community-based participatory research process. The Nutrition Environment Measures Surveys for Restaurants and Stores (Glanz *et al.*, 2007; Saelens *et al.*, 2007) were modified to evaluate campus eating environment venues (restaurants, dining halls, stores; mean n = 25/campus). A modified CDC Walk-ability Audit (Dannenberg *et al.*, 2005) was used to assess approximately 45 walking/biking segments per campus. Students (n = 1645) completed an online behavioural survey and measured heights and weights were used to calculate body mass index (BMI). Relationships between environmental and student behaviour/health variables were assessed with Pearson correlations. Student fruit, vegetable, and fat intake scores and student BMI were not associated with campus eating environment scores. In contrast, the walk/bike-ability campus score was positively related to student walking scores ($r = 0.83$, $p < 0.001$) and inversely related to students' BMI ($r = –0.54$, $p < 0.04$). Although the college walking/biking environment appears to be effective in supporting physical activity, contributing to obesity prevention, the relationship between the campus eating environment and students' dietary intake is less evident. Campuses provide an eating environment with an array of dining and shopping venues, most of which are not complying with dietary recommendations for obesity prevention. Assessing post-secondary institution campuses for environmental supports of healthful lifestyles and associated behaviour is important and may provide the impetus for campus initiatives to evaluate and improve the quality of eating environments.

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885. IS A QUANTITATIVE GUIDE TO HEALTHY EATING THAT PROVIDES A 7-DAY MENU EFFECTIVE AT IMPROVING REPORTED DIETARY INTAKES?

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In the UK the eatwell plate provides consistent visual messaging on the requirements for a healthy diet. However, evidence suggests that people have difficulty interpreting this guidance and dietary targets are still not met. A quantitative guide to healthy eating, which translates UK healthy eating advice in the form of a weekly menu has been developed. This single arm, pilot study aimed to determine the effect of using this resource on adult female dietary intakes. Effects on waist circumference and wellbeing plus views on acceptability, ease of implementation and cost were sought. Measurements were recorded at baseline and after 2 weeks of implementing the menu. Nineteen women, mean age 47 years, were recruited from a large worksite. The majority were overweight or obese. The attrition rate was 31%. At follow-up self reported consumption of fresh fruit, root and green vegetables and oil rich fish were significantly increased ($p = 0.001$, $p = 0.039$, $p = 0.004$, $p = 0.021$ respectively). Consumption of crisps and savoury snacks were significantly decreased ($p = 0.001$). Indicators of wellbeing and energy were also improved ($p = 0.006$, $p = 0.039$). No effect on waist circumference was observed. Respondents indicated that the menu was practical and acceptable but more expensive than usual food costs. This quantitative guide to healthy eating, based on commonly eaten foods, shows promise as a resource to improve dietary intakes towards the achievement of national dietary targets. A larger study of longer duration is required to determine the sustainability of dietary changes and health outcomes.

11.7 Childhood Obesity

515. A PARENT-LED FAMILY-FOCUSED TREATMENT PROGRAM FOR OVERWEIGHT CHILDREN AGED 5 TO 9 YEARS: FIVE YEAR ANTHROPOMETRIC OUTCOMES

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We have previously shown that a family-focussed weight management program can achieve relative weight loss of ~10% in moderately obese prepubertal children with loss maintained for 2 years from baseline. This study aims to determine long-term results, i.e. 5 years from baseline. Height, weight, waist circumference (WC) were collected from children in two single-blinded randomised controlled trials (Golley *et al.* 2007; Magarey *et al.* 2011). BMI (wt/ht^2) and WC z-scores were calculated using lmsgrowth excel add-ins (http://www.healthforallchildren.co.uk). Data points were baseline, 6 (intervention end), 12, 18, 36 and 60 months. Linear mixed model analysis including time (repeated factor), group, sex and interactions was conducted. Of the

169 PEACH participants (mean (SD) baseline age: 8.2 (1.2) years, 44% boys) allocated to Healthy lifestyle (HL) or HL + parenting, 78 (46%) attended measurement at 60 months. There was a significant time ($p < 0.001$) but no group ($p > 0.0.58$) effect. At 60 months compared with baseline BMIz was lower (0.48, CI: 0.34–0.61; 19.8% CI: –38–78%) as was WCz (0.39, CI: 0.12–0.58; 12.2% CI: –56–81%). Of the 38 HELPP participants (8.2 (1.1) years, 37% boys) allocated to HL + P the arm common to both studies, 15 (39%) attended 36/60 month assessment. Significant time effect was observed BMIz ($p = 0.014$), WCz ($p < 0.001$) with 60 month values lower than baseline (BMIz: 0.58, CI: 0.07–1.09; WCz: 0.29, CI: –0.04–0.62). Results of these two programs indicate participation in a family-focussed weight management program can result in significant relative weight loss up to 4.5 years from the end of the program although the > 50% loss to follow-up limits generalisability of the results.

665. DETERMINANTS OF OBESITY AMONG CHILDREN

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The rise of obesity in the country and the shift from undernourished to overweight children is an emerging public health concern. Determinants of obesity among children must be identified to stop its growth. 360 Grades 4 to 6 students from three public elementary schools in Makati City were used as respondents using a case–control design with overweight schoolchildren as cases and normal-weight schoolchildren as controls. Food intake was obtained using 24-hour food recall and food frequency questionnaire. Level of physical activity was examined using a physical activity questionnaire. Hours spent being sedentary was explored by assessing the number of hours spent for watching TV. The association of BMI with dietary intake, physical activity, and birth weight was analysed using logistic regression. When physical activity was held constant, children consuming a diet more than 100 percent of their energy requirement were six times more likely to be overweight than children consuming less than or equal to 100 percent. Children with low physical activity are 33 times more likely to be overweight than children with high physical activity regardless of age, sex and food intake. Gender confounds the relationship between birth weight and overweight. Food intake and physical activity of the child are associated with being overweight while gender may influence the association between birth weight and being overweight. Healthy dietary behaviour and physical activity be promoted at home and in school. Further studies may be taken involving large sample size to determine if gender may influence the association of birth weight and nutritional status.

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686. AUSTRALIAN NATIONAL CHILDREN'S NUTRITION AND PHYSICAL ACTIVITY SURVEY: CHARACTERISTICS ASSOCIATED WITH EXCESSIVE INTAKE OF 'EXTRA' FOODS

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'Extra' foods continue to be over-consumed by Australian children (Rangan *et al.*, 2011). This study aims to report characteristics associated with 'extra' food consumption by examining data from the 2007 Australian National Children's Nutrition and Physical Activity Survey. Data from one 24-hour diet recall conducted at a face-to-face interview were used. Foods were categorised as 'core' or 'extra' primarily based on the criteria set out by Rangan *et al.* with an exception in classifying sausages and bacon as 'extra' foods in the present study. 'Extra' food providing 600 kJ energy was considered one serve(s), consistent with The Australian Guide to Healthy Eating. Socio-economic indexes for areas were used as proxies for the socio-economic status (SES) of participants. Higher 'extra' food consumption was significantly higher ($p \leq 0.001$) for boys (♂5.8 s; ♀5.0 s), older children (14–16 years 7.1 s; 2–3 years 2.8 s), lower SES (most disadvantaged 5.7 s; least disadvantaged 4.9 s), lower household income (weekly gross earnings ≤$499/week 6.2 s; ≥$2000/week 5.3 s) and non-school days (non-school days 6.0 s; school days 5.0 s). Highest consumption of 'extra' food was recorded for Saturdays in children aged 2–3 years (range 3.7–7.6 s) and Fridays for those aged 14–16 years (8.1 s). One parent families compared to two parent families with children < 15 years consume more extra foods ($p = 0.001$). Weight status was not associated with 'extra' food consumption ($p = 0.971$). This study identifies potential target groups for public health policy and interventions given the established link between diets high in fat, sugar and salt and chronic disease.

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610. FLAVOURED MILK CAN HELP TO INCREASE TOTAL MILK INTAKE AND LIKELIHOOD OF MEETING CALCIUM EAR WITH NO IMPACT ON BMI IN AUSTRALIAN CHILDREN

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Almost 60% of Australian children aged 9–16 years are not meeting the estimated average requirement (EAR) for calcium. International research shows that drinking flavoured milk is an effective way to increase children's intake of milk and calcium without adversely influencing body weight. The purpose of this study was to determine the influence of flavoured milk consumption on nutrient intake and weight status among Australian children. Nutrient intakes reported via 24-hour recalls and anthropometric measurements collected from the 2007 Australian National Children's Nutrition and Physical Activity Survey were analysed. Children and adolescents (n = 4487, 2–16 years) were classified according to milk drinking: exclusively plain, flavoured and non-consumers. Total daily milk, energy and nutrient intake, body mass index (BMI) and waist circumference were compared between categories of milk drinking by linear regression. Flavoured milk drinkers reported higher total daily milk intake and were more likely to meet the EAR for calcium than plain milk drinkers and non-consumers of milk ($P < 0.05$). Intakes of protein, total and saturated fat, calcium, phosphorus, magnesium and vitamin A (adjusted for age, gender and energy intake) were comparable between plain and flavoured milk drinkers and were significantly higher than that of non-consumers of milk ($P < 0.05$). Flavoured milk drinkers had higher sugar and energy intakes than plain milk drinkers and non-consumers of milk ($P < 0.05$), while BMI and waist circumference were comparable. These results suggest that drinking flavoured milk may help increase milk intake and aid children in meeting the EAR for calcium without impacting on body weight measures.

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915. CAN A REDUCED CARBOHYDRATE DIET BE USED TO REDUCE CARDIOVASCULAR RISK IN OBESE ADOLESCENTS? RESULTS FROM THE EAT SMART STUDY

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Eat Smart is a randomised controlled trial, evaluating two different dietary patterns ('low fat': 55% carbohydrate, 25% fat versus 'reduced carbohydrate': 35% carbohydrate, 35% fat) for the treatment of adolescent obesity. An initial 6-week group 'FRIENDS for life™' program acted as a preparatory phase for behaviour change. Individualized dietetic advice was provided using a structured approach with a tailored energy prescription based on measured resting energy expenditure. Blood was drawn at baseline and at week 12 for insulin, glucose, lipids (LDL, HDL, triglycerides), leptin and a range of adipokines and cytokines. A total of 87 individuals (mean age 13.1 years, 79% female, mean (SD) BMI z-score 2.2 (0.4)) were randomised (n = 36 low fat, n = 37 reduced carb, n = 14 control). At week 12 there was a significant overall association between diet and BMI z-score ($p < 0.001$); a mean (SD) change in BMI z-score of –0.13 (0.10) in the modified carbohydrate; –0.12 (0.11) low fat and +0.02 (0.03) controls, with post-hoc analysis indicating significant differences between the active diets and the control group (both $p < 0.001$). There were no significant differences between the modified carbohydrate and low fat groups for any biochemical markers except ICAM-1 ($p = 0.02$). Eat Smart demonstrated that modifying dietary carbohydrate is equivalent to a low fat approach with regards to weight loss and has no adverse effect on biochemical markers. Modest weight loss *per se* was associated with favourable shifts in cardiometabolic risk factors suggesting that reducing dietary carbohydrate is an alternative to the standard low fat dietary advice.

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1000. PROTEIN AND ENERGY INTAKE AND GROWTH VELOCITY IN VERY LOW AND EXTREMELY LOW BIRTH WEIGHT INFANTS

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Despite improved survival rates, very/extremely low birth weight infants require intensive nutritional management. Achieving and maintaining satisfactory rates of growth remains an ongoing challenge for health care teams. Given the heterogeneous nature of these infants and the variation, practicality and uncertainty of evidence-based standards of care currently available, reports of feeding practices and growth outcomes continue to vary considerably. This pilot study aimed to determine protein and energy intakes and growth velocity in very low and extremely low birth weight infants. Retrospective and prospective data was collected over a 6-week period for infants in the two birth weight categories. All recorded weights were documented and raw data on all enteral and parenteral protein and energy sources were detailed for full 24-hour periods. Mean protein and energy intake were calculated. Nineteen infants met the inclusion criteria and a total of 885 days of data was collected. Infants had a mean ± SD protein intake of 3.5 ± 0.7 g/kg/day, energy intake of 150 ± 32 kcal/kg/day and a weight growth velocity of 13.7 ± 1.8 g/kg/day. Three infants reached protein recommendations of 4 g/kg/day and 16 infants met an energy intake of 120 kcal/kg/day. Preliminary analysis indicated that protein intake was positively related ($p < 0.05$) to growth velocity. From birth to one month of life, protein deficit increased from 16.8 ± 2.5 to 38.5 ± 6.4 g/kg while energy deficit decreased from 370.5 ± 82 to 228 ± 214 kcal/kg. This study highlights the challenges of achieving intrauterine growth and suggests that improved protein intake may have a significant positive effect on growth and replacing early deficits.

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942. I ONLY EAT LOCAL: PERCEPTIONS OF NUTRITION AND ENVIRONMENTAL HEALTH MESSAGES

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Nutrition and environmental health is becoming increasingly important for patients, clients and the general public ("clients"). Issues such as antibiotic, hormone and pesticide usage in food production; genetic modification; and sustainable agriculture are just some of the emerging areas where questions about food safety and health impact arise. Clients turn to dietitians for answers to their questions. In August 2011 data was released from a provincial study examining knowledge related to current food production methods, nutrition and environmental health, and preparedness for practice of dietitians licensed within the last five years in Ontario, Canada. Data collection continued through key informant interviews and focus groups. Findings from this study suggest that gaps exist in the education, training and professional development of dietitians in this area. Although new practitioners acknowledged that clients are interested in nutrition and environmental health and often have questions, practitioners admit they lack the requisite knowledge and skills to confidently address them. New practitioners commonly expressed comfort with the message that "Locally grown is best" but were unable to define this message. Key informants identified environmental issues related to food production as both curriculum and practice gaps in dietetics. Study participants were unaware of resources to upgrade their knowledge and skill in this area. The provision of client-centred care in dietetics involves remaining current regarding areas of interest to clients. Clients are increasingly interested in nutrition and environmental health. Curricular change and ongoing professional development is recommended for dietitians to ensure they remain a trusted resource.

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871. THE ASSOCIATION BETWEEN MOTHERS' PERCEPTION OF CHILD PICKY EATING AND THE USE OF PRESSURE FEEDING IN A SAMPLE OF INDIAN-AUSTRALIAN MOTHERS

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Caucasian mothers' perception of child picky eating has been associated with higher use of pressure feeding. However, culture is an important influence on child feeding and dietary practices and generalisability of these associations to other cultural groups is unclear. This cross sectional study aimed to explore the association between Indian mothers' perception of child picky eating and use of pressure feeding practices. Using snowball sampling we recruited 230 Indian mothers (mean: 32 years ± SD: 3.3) with a child aged between 1–5 years (34 ± 14.0 months), residing in Australia for a period of 1–8 years. Pressure feeding (dependant variable) was measured as the mean scores of the pressure scale obtained from the Comprehensive Feeding Practices Questionnaire (Eizenman *et al.*, 2007). A single question assessed perception of pickiness (independent variable) sourced from the NOURISH questionnaire (Daniels *et al.*, 2009).The association was examined by hierarchical regression analysis. Mothers were more likely to pressure feed if they

perceived their child as a picky eater (3.2 ± 0.9 mean score) than a non-picky eater (2.9 ± 0.8 mean score), R^2 change = 0.02, F_{change} = 4.3, p = 0.04, even after adjusting for significant covariates: child age, gender and weight-for-age z score. Girls (p = 0.006), older children (p = 0.001), and children with higher weight-for-age z scores (p = 0.007) were pressure fed to a greater extent. The association between pickiness and pressure feeding among the Indian sample was similar to that reported in Caucasian mothers. This suggests that interventions promoting positive feeding practices among Caucasian mothers may be suitable for guiding migrant Indian mothers' feeding practices.

Funding source: PhD Scholarship provided by the Queensland University of Technology, Brisbane, Australia

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11.8 Dietary Habits and Health
LEAD SESSION: DIETARY PATTERNS, FOODS AND NUTRIENTS IN PREVENTION OF CHRONIC DISEASE

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There is no magic bullet or simple solution to prevent chronic disease. It is multifactorial in nature. Lifestyle factors, including dietary behaviors, can be major, minor, or non-contributors, depending on the chronic disease in question. This presentation examines different ways of approaching diet-chronic disease links in nutrition education and prevention research. The bulk of scientific evidence and translational research suggests that the scientific evidence is usually stronger for associations between dietary patterns and chronic degenerative diseases such as coronary heart disease, than it is for specific foods or dietary supplements, and for this reason guidance focuses on food-based dietary patterns. The pros and cons of several examples of criterion-based and data-driven food based dietary guidance will be discussed from educational and research standpoints. Food groups, foods and nutrients are also associated with prevention of chronic degenerative diseases. Government agencies in Australia, Europe, the USA and other countries review and approve statements or claims describing these diet-disease associations. Examples of these and their strengths and weaknesses from the educational and prevention research standpoints will be summarized. Both holistic and reductionist approaches linking diet to prevention of chronic disease risk have utility in research and nutrition education. Dietary patterns are useful for educational purposes and for hypothesis generation. Foods, food groups and nutrients are helpful for other educational and informational purposes, and in research for hypothesis testing, estimating effect sizes and scaling up successful interventions to prevent diet-related chronic degenerative disease.

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137. THE INFLUENCE OF THE MODERNIZATION OF DIETARY HABITS TO THE DIET INDUCED THERMOGENESIS (DIT)

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The modern dietary habits as typified by the midnight eating, fast eating and soft-meal, were pointed out to become one of the motives of the obesity. We examined the influence of the modernization of dietary habits to give the diet-induced thermo genesis. Healthy young women were selected to be subjects in this study, and we measured energy expenditure in all subjects by using indirect calorimeter. This study was consisted of the following three studies. Set two types of eating rhythm in the morning eating type at 7:00, 13:00, and 19:00 and the night type at 13:00, 19:00, and 1:00. Set two types of eating speed in the fast eating time of 5 minutes and control time of 15 minutes. Set three types of meal forms in the solid meal, liquid meal and liquid meal without chewing. The morning eating type was significantly increased DIT compared with the night type. The fast eating was significantly decreased DIT compared with the control. The solid meal was significantly increased DIT compared with the liquid meal. The results suggest that the midnight eating, fast eating and soft-meal could be decreased the energy consumption of DIT. Hence, it is thought the modern dietary habits have possible effects on the progress of obesity.

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275. DIETARY HABITS MAY BE ASSOCIATED WITH SLEEP–WAKE RHYTHM DISORDERS

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The aim of this study was to examine whether dietary habits might be associated with sleep–wake rhythm disorders in Japanese population. We used the cross-sectional data from a baseline survey of the Japan Multi-Institutional Collaborative Cohort Study (J-MICC Study), in Tokushima Prefecture. A total of 1070 subjects (767 men and 303 women) recruited into a baseline survey of the Tokushima J-MICC Study from 2008 to 2011 were analysed. The participants completed a questionnaire on lifestyle factors including sleep duration and presence or absence of sleep–wake rhythm disorders, and a food frequency questionnaire (FFQ). Sleep–wake rhythm disorders were defined as self-reported deficiency of the regularity of the sleep. Daily intakes of energy and macronutrients were estimated based on the data from the FFQ. The subjects whose energy intake by carbohydrates was greater than 70% of total energy intake had more sleep–wake rhythm disorders than those whose energy intake by carbohydrates was less than 70% of total energy intake. The subjects who took both a breakfast and a lunch more than five days in a week showed less sleep–wake rhythm disorders than the others. Sleep–wake rhythm disorders were more frequent in the subjects who took beyond one dish (or one cup) of staple food at dinner than in those who took one dish, and as for lunch, the same result was found. These results suggest that taking daily three meals regularly in frequency and moderately in amount might be a better way to avoid sleep–wake rhythm disorders.

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112. GLYCEMIC INDEX, GLYCEMIC LOAD AND RISK OF OESOPHAGEAL SQUAMOUS CELL CARCINOMA (ESCC): A CASE–CONTROL STUDY

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Habitual consumption of diets with high glycemic index (GL) and high glycemic load (GL) has been associated with substantial risk of cancer via hyperinsulinemia and the insulin-like growth factor (IGFs) axis. Although carbohydrate intake has been associated with ESCC risk previously, this effect has not been studied in terms of GI and GL, which represent indirect measures of carbohydrate absorption and dietary insulin demand. The aim of this case–control study was to investigate the effect of dietary GL and GI on risk of ESCC in a high-risk popula-

tion in Iran. In total, 47 cases with incident ESCC and 96 frequency-matched hospital controls underwent private interviews and average dietary GI and GL were calculated from a validated food frequency questionnaire. Dietary GL was calculated as a function of GI, carbohydrate content and frequency of intake of individual foods. Mean ± SD dietary GI and GL levels were significantly higher among ESCC cases compared to controls (p-value: 0.006). After adjustment for potential confounders, those in the highest tertile of dietary GI had 6.20 times higher risk of ESCC, compared to those in the lowest (95% CI: 1.49–25.81; p-trend: 0.011). In addition, being in the highest tertile of dietary GL was positively associated with the oesophageal cancer risk (OR: 9.71, 95% CI: 2.33–40.55; p-trend: 0.002). Findings of the present study indicated that diets high in GI and GL might have potential unfavourable effects on ESCC risk, and suggested a possible role for excess circulating insulin and related IGFs in oesophageal cancer development.

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757. A SIMPLE NUTRITIONAL INTERVENTION TO REDUCE THE N6:N3 PUFA RATIO IN THE AUSTRALIAN DIET

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Claims have been made that the level of omega-6 (n-6) fats in the diet are too high and that this cannot be reduced without increasing the saturated fat intake. The aim of the study was to design a diet within the framework of the Australian Guide to Healthy Eating (AGHE) which would supply < 2% energy (%e) from the omega-6 polyunsaturated fatty acid (n-6 PUFA) Linoleic Acid (LA) compared with the 7–8%e in the current Australian Diet. Separate 7-day diet plans were designed using FoodWorks (version 2009) for males (10,000 kilojoules (kJ)/day), and females (8,000 kJ/day). The reduction in dietary n-6 PUFA content was achieved by replacing high-LA plant-based cooking oils and spreads (canola and sunflower oils), with high-oleate macadamia oil and butter and restricting the intake of some processed foods. All diets complied with the AGHE. Diets were designed which complied with the AGHE and which had an LA content of 1.80%e and 1.75%e in females and males respectively. In both cases, the n-6 : n-3 ratio was reduced to 5:1, compared to 12:1 in the typical Australian diet and the saturated fat content was < 10%e. These results suggest that reducing the LA content of the diet can be readily achieved within the boundaries set by the AGHE, without an increase in saturated fat intake.

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958. SYSTEMATIC REVIEW UPDATING THE EVIDENCE OF THE EFFECT OF OMEGA 3 FATTY ACIDS IN THE TREATMENT OF OVERWEIGHT AND OBESITY IN ADULTS

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Omega-3 fatty acids have suggested health benefits, including normalising plasma triglyceride and cholesterol concentrations, anti-inflammatory properties and improved insulin resistance. This systematic review evaluated the evidence for the role of omega-3 fatty acids in obesity interventions. The review informed the revision of the Dietitians Association of Australia (DAA) Best Practice Guidelines for the Treatment of Overweight and Obesity in Adults. Randomised controlled trials or systematic reviews in overweight or obese healthy adults published from 2003 to March 2010 were sourced from databases using standard search terms. Eligible studies had data extracted and were assessed for quality using the American Dietetic Association quality criteria checklist. The initial search located 1082 articles. Eight studies met the inclusion criteria (all RCTs) had data extracted and were included in the body of evidence statement. Six studies, using 790 mg to 2.8 g omega-3 fatty acids/day, demonstrated weight loss of 4.5–10.9 kg in both trial arms. All were of short duration, 3–12 weeks, and had small sample sizes. This indicates that 790 mg–2.8 g omega-3 fatty acids per day was as equally as effective in achieving 4.5–10.9 kg weight loss in overweight and obese adults as energy restriction alone. However, there are concomitant health benefits beyond weight loss from enhanced omega-3 fatty acid intakes. These findings have implications for DAA weight loss guidelines and dietetic practice.

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SATURDAY 8 SEPTEMBER 2012

Final Session

PLENARY: LEADERSHIP IN DIETETIC EDUCATION: DISCRETION POWER AND RESEARCH ABILITY

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In a rapidly changing society, the work and role of dietitians may have to change. Education must play a major role in these changes. In Japan basically there is a dietitian at each school. The school lunch DRIs are categorized into 3 age groups for elementary school children, 1–2, 3–4 and 5–6 grade. However, for example, the leftovers are different for children in 1st grade compared to those in 2nd grade. To take another example, the energy requirements for children who belong to sports clubs differ from those who get little physical exercise, even though they are the same age. Dietitians should not just follow the figures in the tables provided by experts but they themselves should calculate the requirements for the children actually in their school. In other words dieticians must have discretionary power. However, discretionary power also involves responsibility. To support this responsibility, scientific evidences are required but they have been limited. Although Asian countries try to follow information about nutrition and health from western countries, their problems are often very different. Furthermore, developed countries themselves have major problems such as obesity and metabolic syndromes in spite of intensive research employing modern technologies. These facts show that research in applied nutrition fields is limited world-wide. Research in applied nutrition field is usually complicated and needs good knowledge about the methods and data analysis. To achieve this we have to re-consider education for dietitians.

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PLENARY: ADVANCING THE NUTRITION CARE PROCESS – A DUTCH PERSPECTIVE

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The Nutritional Care Process (NCP) should keep up with the latest developments in health care. In the presentation the approach of the nutrition care in disease management models and performance management will be raised as well as aspects of direct access. Dutch care for diabetes, cardiovascular risk management, obesity and COPD is organized in chronic disease management models. These models describe from patient perspective where good quality care should comply, not only with clinical guidelines, but also with the organization of it and supporting of self management. The disease management models are functionally described; professions are not mentioned only competences which are needed within the multidisciplinary team. As nutrition care is needed in all existing and newly developed disease management models a generic nutrition care model is developed. This model describes 4 levels of nutrition care. As care providers have to give account to the Public Health Inspection, users and health insurance company's performance indicators became important. Besides being involved with developing indicators for disease management, we also started to develop our own dietetic indicators. Standardized language using ICF-Dietetics, training dietitians on dietetic diagnosis, goals and outcome data are supportive tools. Another aspect which influences the Dutch NCP is direct access to the dietitian; a referral is no longer needed by law since august 2011. For this new approach a step 'screening' is added to the NCP. It supports dietitians to verify if there are signals/symptoms/patients expectations which needs medical examination first or should better be treated by another professional.

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PLENARY: TRENDS IN TRAINING FOR NUTRITIONISTS AND DIETITIANS IN THE CARIBBEAN: RESTRUCTURING THE PROFESSION IN THE CARIBBEAN

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Despite its small size, the case study of the Caribbean region could be instructive in how a diversified profession would strengthen professional growth. This paper will describe the historical trends and efforts at restructuring the profession of nutrition and dietetics in the Caribbean to illustrate the processes followed and the progression of training. Data were collected from members of the Caribbean Association of Nutritionists and Dietitians by two sets of emailed questionnaires. This was followed by a face to face workshop consultation one year later, and with subsequent small group discussions to achieve consensus. Initial responses revealed seventeen pathways to qualification depending on country where trained and the main focus of the curricula. Responses to the second questionnaire detailed post-didactic training expressed as internship, practicum, supervised practice and/or research. These responses were rationalized in subsequent discussions and consensus reached on relevant professional titles and qualifications. Professional advancement in the future will come from promoting greater diversity of the dietetics profession and this while inculcating a unification of identity. Professionals with diverse backgrounds are better able in a limited job market, to create niches for themselves in various sectors in addition to health and government. Of necessity is to create a clear image of our unique identity and to minimize confusion with varied professional titles and qualifications. Developing generic training programmes allows for more effective positioning of our capabilities to potential users of our services and to facilitate free movement of professionals throughout the region.

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PLENARY: POSITIONING THE PROFESSION – DOING WHAT IT TAKES

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The profession of dietitian has different regulations and denominations around the world. It is required a strong position to protect professional fields of dietitians. Objectives. (a) Highlight the different regulations of the profession; (b) Suggest working lines to oppose against professional encroachment. (c) Report AEDN's experience in this field. Method. The levels of education required to practice as a dietitian, are being harmonized. However, the wide range of postgraduate education on nutrition and dietetics addressed to other professionals supposes a problem of invasion of competencies in the profession of dietetics. In Spain BSc on Nutrition and Dietetics trained to practice as dietitian-nutritionist. Among the actions carried out by AEDN, was the denunciation on the Supreme Court against BSc of pharmacy and nursing, due the invasion of Dietetics' competences. The Court was clear by giving pharmacists and nurses some knowledge in Dietetics, while the dietitian-nutritionist has the professional training to the dietetic practice. Also, AEDN has had a positive judgment against Naturhouse, multinational that offers dietetics products and services, supporting our responsibility of acting when some services create insecurity to citizen, about its effect and the professional training of who is offering dietetics' services. These judgments have been helpful to AEDN's working group created expressly against professional encroachment. Conclusion. It's necessary to: (a) ensure legal regulation of the professional competencies in Dietetics through graduate and postgraduate education and legal bodies; (b) achieve the highest level of education and training for dietitians; (c) strengthen structures of Dietetics Associations creating commissions against professional encroachment.

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