NUTRITION CONGRESS 2016

LORD CHARLES HOTEL, SOMERSET-WEST

3-5 SEPTEMBER

ABSTRACTS

"Science at the centre of sound nutrition"

Congress Hosts

THE NUTRITION SOCIETY OF SOUTH AFRICA

NSSA

ADSA association for dietetics in south africa

26th Congress of the Nutrition Society of South Africa (NSSA) | **14th** Congress of the Association for Dietetics in South Africa (ADSA)

1. Dietary assessment and nutrition intervention for school age children in Nigeria

Bisola Akano, Rasaki Sanusi, Catherine Oladoyinbo

Introduction: Dietary assessment is essential in deterring nutritional status. Nutrition Intervention (NI) has been shown to reduce undernutrition among School Age Children (SAC).

Aim: To assess dietary intake of SAC and also evaluate NI for undernourished SAC in Nigeria.

Methods: A quasi-experimental study comprising three phases was conducted among 7-11 year-old SAC. A validated semi-structured interviewer-administered questionnaire was used to obtain information on SAC's demographic characteristics. Anthropometric measurements were taken and 24-hour dietary recall questionnaire administered. At phase II, 142 identified SAC with Wasting (SACW) were randomized into four groups: group I: each child given 69g High Energy Biscuit (HEB), group II: SACW's mothers received Nutrition Education (NE), group III: SACW received HEB and their mothers; NE, group IV (control). At phase III, nutritional status of SACW was reassessed. Nutritional status was determined using WHO-Anthro plus, food intake data analysed using Total Dietary Assessment software. A 50-point knowledge scale was used to assess mothers' nutrition knowledge pre and post-intervention. Data were analysed using descriptive statistics, Chi square test and ANOVA at p=0.05.

Results: SAC's age was 9.4±1.3years. At baseline, height was 127.0±8.5cm while weight was 24.15±4.5kg. Prevalence of wasting was 8.6%. Energy and protein intakes were 1,312.6±314.5kcal/day and 29.5±11.7g/day, respectively. Post-intervention, weight significantly increased by 2.2±1.2kg, 1.1±0.9kg and 2.2±1.1kg among groups I, II and III respectively, while the control's decreased by 0.2±0.8kg. Prevalence of wasting significantly reduced by 90.6% (group I), group II: 63.9% and group III: 90.9%, but reduced by only 12.2% among the control. Mothers' knowledge score increased significantly from 32.9±7.2 to 43.8±4.5 after NE and the change was significantly associated with wasting reduction among SACW.

Conclusions: HEB and NE reduced wasting among SAC in Nigeria. Such interventions are recommended for SAC.

Keywords: Dietary assessment, School age children, High energy biscuit, Nutrition education

2. Prevalence of obesity among nurses in Nigeria

Bisola Akano, Catherine Oladoyinbo, Nimot Wahab, Rasaki Sanusi, Blessing Okpo, Blessing Okpo

Introduction: Overweight and Obesity is an escalating health problem in both developed and developing countries.

Aim: The study is aimed at determining prevalence of obesity among nurses in Nigeria.

Methods: A descriptive cross sectional study was carried out among 120 male and female nurses selected using a multistage sampling technique. Data were obtained using a validated semi-structured and pretested questionnaire to elicit information on demographic characteristics of the respondents. Anthropometric measurements were taken and a 24-hour dietary recall questionnaire was administered. Data were analysed using inferential and descriptive statistics. Body Mass (BMI) of the respondents was calculated using height and weight measurements and was classified according to the World Health Organisation (WHO)'s classification of obesity. Nutrient intake was analysed using Total Dietary Allowance (TDA) software. Significant differences were analysed using Chi square test and ANOVA at p=0.05.

Results: Age of the respondents was 39±9.7years and 39±9.6years for male and female respondents. Height was 1.69±11.2m and 1.62±6.69m while weight was 75.8±9.2kg and 69.3±11.95kg respectively for male and female respondents. They were of grade 1 obesity and the difference was not significant between male and female respondents. Calorie intake of the male respondents was more (2422.5±76.5Kcal) than the females' (1.7826±80.5Kcal) while carbohydrate intakes were for male (355±99.1g) and female (277±79.3g) respondents. These values were higher than the Recommended Dietary Allowance (RDA).

Conclusion: Obesity is prevalent among nurses. Nutrition education is advocated to reduce its prevalence among them.

Key Words: Anthropometry, Body Mass Index, Obesity, Nurses

3. Acute effects of different dietary polysaccharides added in milk on food intake, postprandial appetite and glycemic responses in healthy young females

Muhammad Umair Arshad, Saima Ishtiaq, Farhan Saeed, Ali Imran

Dietary polysaccharides may contribute to metabolic and physiological regulations, including satiety and glycemia, because of their properties of adding bulk and producing viscosity. In the present study we compared the postprandial glycemic and satiety responses of different dietary polysaccharides when added in milk (2% M.F.). The objective of this study was to evaluate the potential of different polysaccharides against postprandial glucose, appetite responses and food intake at subsequent meal. In a repeated measures crossover trial, 30 female participants (18-30 years) randomly consumed 250 ml milk 2% M.F. (control), or milk containing carrageenan (2.5g), guar gum (2.5g), and alginate (2.5g). An ad libitum pizza meal was served to measure the food intake at 120 min following the treatments. Alginate and guar gum addition resulted in lower food intake as well as cumulative energy intake at subsequent pizza meal compared with control treatment. The post-treatment (0-120 min) as well as cumulative (0-170 min) postprandial glucose levels and average appetite scores were also significantly suppressed following alginate and guar gum compared with control ($P < 0.0001$) with more pronounced effect of guar gum during post-treatment time (0-120 min). However, alginate resulted in significantly lower blood glucose mean values ($P < 0.0001$) compared with control as well as carrageenan during post-treatment (0-120 min) and cumulative periods (0-170 min). Concludingly, addition of polysaccharides in milk particularly, alginate and guar gum would be beneficial in the short term regulation of postprandial glycemia and satiety, respectively.

4. Prevalence of eating disorders among dietetic- versus non-dietetic students at UKZN

Jandri Barnard, Frederick Veldman, Suna Kassier

Introduction: It is expected that eating disorders (EDs) are more prevalent among first year dietetic students, but results contra-indicate that it is higher in first year non-dietetic students. Eating behaviour and eating attitude of students also vary among study majors, as well as subsequent years of dietetic study.

Aim: To determine and compare the i)BMI, ii)eating behaviour and iii)eating attitude of a sample of 62 first-,third- and fourth year dietetic- versus 83 first year non-dietetic students.

Methods: A cross-sectional descriptive survey conducted by using the SCOFF- and EAT-26 questionnaire (eating behaviour) and TFEQ (eating attitude) to compare convenience sample of female undergraduate students(N = 145). It compared first-(n = 24), third and fourth year(n = 38) dietetic students and first year non-dietetic students(n = 83).

Results: First year non-dietetic students had a higher prevalence for Bulimia Nervosa (SCOFF1-11%),binge eating(SCOFF2-53.7% and EAT A–22.9%),weight loss(SCOFF3–20.7%)and believing themselves to be fat(SCOFF4–50%).While first year dietetic students had a higher indication for food dominating their lives(SCOFF5–41.7%),Bulimia Nervosa(EAT B–4.2%),using diet pills for weight loss(EAT C–16.7%)and being previously treated for an ED(EAT D –8.3%).But the mean BMI of first year dietetic students(23.2±4.3 kg/m2)was lower than first year non-dietetic students(24.2±5.3 kg/m2).

Conclusion: While food dominates the lives of dietetic students, there is an indication that non-dietetic students have a higher prevalence of EDs,which can be screened at university level with a suitable researched screening tool in the future.

5. Iodine status of complementary-fed South African infants receiving lipid-based nutrient supplements: A randomised controlled trial

Jeannine Baumgartner, Jennifer Osei, Tondeyrai M Matsungo, Marinel Rothman, Mieke Faber, Marius Smuts

Introduction: The introduction of complementary foods poses a serious risk for deteriorating iodine status. Thus, iodine fortification of complementary foods is recommended to ensure sufficient intake.

Aim: To assess iodine status of peri-urban complementary-fed South African infants and to test the efficacy of small-quantity lipid-based nutrient supplements (SQ-LNS) in maintaining adequate iodine status.

Methods: Infants aged six months (n=750) were assigned to one of two SQ-LNS/day, both fortified with 45µg iodine, or a control group not receiving SQ-LNS. Urinary iodine concentrations (UIC) were measured at baseline (n=386) and at 12 months (n=262).

Results: The geometric mean (95%CI) UIC at baseline was 333.8 (310.5,358.9)µg/L and decreased to 214.9 (189.2,242.6)µg/L at 12 months. Non-breastfed infants had lower UIC (159.6 [65.9,397.5]µg/L) and higher odds for being iodine deficient (UIC < 100µg/L), than infants who continued to be breastfed (373.2 [202.6,522.9]µg/L) at 12 months. Infants receiving SQ-LNS had higher UIC (P=0.025) and lower odds for having a UIC < 100µg/L at 12 months than controls; adjusting for maternal baseline UIC, age, sex and continued breastfeeding. In sub-group analysis, the effect of SQ-LNS for higher UIC at 12 months was only apparent in non-breastfed infants (P=0.039). These effects were no longer significant after adjusting for infant baseline UIC, reducing the sample size to n=124.

Conclusion: Only in non-breastfed infants, iodine intake decreased from six to 12 months. In those, the provision of 45 µg iodine per day as SQ-LNS resulted in higher UIC at 12 months, but was not efficacious in counteracting an overall decline in iodine status.

6. What the rate of docosahexaenoic acid uptake into the brain tells us about its dietary requirements

Richard Bazinet

The brain is especially enriched with the polyunsaturated fatty acids (PUFA) docosahexaenoic acid (DHA) and arachidonic acid, while being virtually devoid of other PUFA such as eicosapentaenoic acid (EPA). It has been suggested that the plasma supply to the brain regulates brain PUFA levels and replace PUFA consumed in the brain. Candidate plasma pools that supply the brain with PUFA include the plasma unesterified pool, PUFA esterified to lysophosphatidylcholine or the uptake of PUFA-containing lipoproteins via lipoprotein receptors into endothelial cells of the blood brain barrier. This paper will present recent studies that have examined the role of lipoprotein receptors and the kinetics of candidate plasma pools which supply the brain. Upon presenting evidence that the plasma unesterified pool is a major source of brain PUFA, especially for DHA, I will describe how rapid metabolism also maintains very low levels of certain PUFA, such as EPA. Because fatty acid uptake into the brain can be imaged in humans, we can estimate brain PUFA, including DHA, requirements. A better understanding of brain DHA requirements has implications for food choices to maintain brain DHA levels.

7. Risk of Malnutrition in Hospitalized Children

Renee Blaauw, Nina Erasmus, Annemie Lenhoff, Mischa Jamieson, Zimeng Elena Zhang

Introduction: The global prevalence of malnutrition (undernutrition) risk amongst hospitalized children varies between 9-54% (high/moderate risk). As malnutrition is associated with increased hospital-related morbidity, longer length of stay and higher mortality, early identification of at-risk patients should receive high priority. This study aimed to determine the prevalence of children at risk for malnutrition on admission to hospital and relative validity of two screening tools (STAMP and STRONGkids) to assess risk.

Methods: All children aged 2-17 years admitted within the past 48 hours to Tygerberg Hospital (March – April 2015) were eligible, excluding ICU, high care and psychiatric patients. Weight and height measurements; changes in food intake; presence of pain associated with intake; vomiting and/or diarrhoea; previous nutritional intervention and medical diagnosis were recorded. Validity was reported as good if sensitivity and specificity reached ≥80% and kappa statistic ≥0.60.

Results: In total, 152 children (63% male), average age 6.73±3.21 years, were included. Majority were from surgery (49%), general medicine (36%) and oncology (15%). According to STAMP, 59.2% were at medium and 32.2% at high risk. Similar results were found for STRONGkids with 59.9% medium risk and 34.9% high risk. Only 16% received any form of nutrition support prior to hospitalization. Comparing the tools indicated good validity and agreement [sensitivity (96%), specificity (100%), kappa value (0.745)].

Conclusion and Recommendations: One third of all children admitted to Tygerberg Hospital had a high risk of developing malnutrition. Nutrition risk screening should be incorporated into the admission procedure and appropriate action should follow.

8. Proximate Composition and Sensory Profile of Complementary Food Flours Fortified with Moringa Oleifera Leaf Powder

Laurene Boateng, Matilda Steiner-Asiedu, Anna Lartey, Matilda Asante

Background: Traditional complementary foods in developing countries are low in energy and nutrient density. Moringa Oleifera leaf powder (MLP), a reportedly valuable source of macro- and micro- nutrients is being explored for use in infant foods.

Aim: To formulate a complementary food flour, for infants aged 6 - 12 months, made from locally available ingredients and fortified with MLP.

Methods: Four flours, (M1 –M4), formulated from maize, groundnuts, soyabeans and MLP were subjected to sensory evaluation using a five point hedonic scale, where 1 = dislike extremely and 5 = like extremely; proximate and iron determination using AOAC methods, and vitamin A determination using the innovative i-checkTM method.

Results: M4 (maize – 60g, soyabean – 15g, MLP – 15g), had the highest score for overall acceptability and had significantly ($p < 0.05$) higher levels of vitamin A and iron when compared to the other 3 flour formulations. Furthermore, M4 was found to have significantly ($p < 0.05$) higher levels of energy, protein, vitamin A and iron than WeanimixTM, (a traditional complementary food in Ghana). This study demonstrated that, a 50g daily ration of M4, will provide 49–90% and 19–21% of the World Health Organisation (WHO) requirements for iron and vitamin A respectively across the age groups (6-8, 9-11 and 12-23 months).

Conclusions: Complementary foods fortified with MLP may have a great potential to combat malnutrition. Further investigations on the digestibility of macronutrients and bioavailability of micronutrients of formulated complementary foods that incorporate MLP are however needful in order to ascertain their ability to improve nutritional status.

9. Prevalence of fatigue, dehydration and hypoglycaemia amongst mineworkers

Magda Botha

Mineworkers are exposed to harsh working environments, which increase the risk for injuries due to reduced cognitive function, concentration and work capacity – for both underground and aboveground mineworkers. The risk for injuries can be decreased by maintaining energy, hydration and cognitive function throughout the shift. Nutrition plays a vital role in fatigue management strategies. An evidence-based study was conducted amongst 251 underground and 189 aboveground mineworkers. The objective of the study was to determine the prevalence of dehydration, fatigue and hypoglycaemia amongst these participants. Trained fieldworkers used constructed questionnaires to conduct interviews assessing the general health and prevalence these conditions. A registered nurse measured blood pressure and blood glucose levels. Up to 38% of the participants rated their general health as "average" or "not that good". An average of 40% suffered from acute respiratory infections, 30% had high blood pressure and 38% had elevated blood glucose levels. Participants did not take medication for the treatment for chronic conditions regularly. An average of 89% (85% underground and 93% aboveground) reported symptoms of fatigue, dehydration and hypoglycaemia. Blood glucose levels < 5 mmol/l were measured amongst 59% day shift workers and 13% night shift workers. Symptoms of fatigue, dehydration and hypoglycaemia were prevalent at the beginning and the end of the shift. Common symptoms reported included blurred vision, dozing off, cramps, headache, thirst and difficulty to concentrate. Fatigue, dehydration and hypoglycaemia were prevalent amongst these mineworkers, decreasing their productivity and increasing their risk for injuries. Nutrition should form part of fatigue management.

10. The acceptability and impact of RUTF amongst underweight, moderate and severely malnourished children, aged 12 to 60 months

Magda Botha, Dineo Mopeli, Joerien Swanepoel

Underweight amongst children remains a public health challenge, complicated by infectious diseases example HIV and Tuberculosis. The World Health Organization recommends supplementation with a Ready-To-Use-Therapeutic-Food (RUTF) for the management of malnutrition. The aim was to determine taste acceptability and efficacy of a local RUTF amongst young children. An impact study was conducted at a crèche amongst underweight young children. Average weight velocity and recovery rate was calculated after supplementation for 21 days with a local RUTF. Anthropometric data was collected amongst 83 children and 39 children were identified for nutrition supplementation. Post-intervention weights were determined of 32 children who received RUTF. RUTF distribution and consumption was managed by teachers. Taste acceptability was tested amongst 83 children. Majority of the children (97%) enjoyed the taste of the RUTF. Almost half (47%) of the children were underweight-for-age, of which 10% moderately and 2% severely malnourished. Nine percent (9%) of children had a MUAC of 13cm. An average of 2,7 kg was gained, with a mean growth velocity of 6,5 g/kg/day. Twenty eight percent (28%) children achieved moderate growth velocity, 44% achieved catch-up growth and 13% recovered. Most children (78%) remained in the same malnutrition classification. Children enjoy the taste of the locally produced RUTF. Anthropometric indicators increased after 21 days. A catch-up growth rate of 2-5 g/kg/day was achieved; demonstrating recovering in a short period in uncomplicated cases. Recovery can be achieved when moderate and severe malnutrition is early detected, taking into account the effect of infectious diseases and household food insecurity.

11. A content analysis of nutrition information in the Curriculum and Assessment Policy Statement and support materials

Carol Browne

Introduction: The importance of school based nutrition education is recognised for improving diets of South Africans. Some researchers have examined the nutrition knowledge of school children, but without knowing what children are taught the answers may be guess work.

Aim: To identify nutrition related content in the Curriculum and Assessment Policy Statement (CAPS), of the Department of Basic Education (DBE). Secondly the content of nutrition related units in three subjects of three grades from Teacher and Learner Support Materials (TLSM) was analysed to assess accuracy and relevance.

Method: The CAPS content was examined to determine if CAPS provides for adequate nutrition education at schools. A content analysis was used to assess three subjects compared to the Food Based Dietary Guidelines (FBDGs).

Results: The overview of CAPS showed that information does not progress

over grades. Different food groups are used, that are not compatible with the FBDGs. The FBDGs are mentioned in only three subjects, with limited teaching time. The South African Food Guide (FG) is not used, but a South African Pyramid is named. The content analysis showed that information was often inaccurate, not country based, irrelevant and that relevant information was omitted. Different food groups and FG are used. Deficiency diseases included are not public health problems in South Africa, yet problems are not included.

Conclusion: Nutrition education at schools is unlikely to lead to improved nutrition knowledge, attitude or practice among school children and their families.

12. Omega-3 fatty acids and inflammation: from mechanisms to clinical practice

Philip C. Calder

Inflammation is a condition which contributes to a range of human diseases. It involves a multitude of cell types, chemical mediators, and interactions. Eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA) are omega-3 (n-3) fatty acids found in oily fish and fish oil supplements. These fatty acids are able to partly inhibit a number of aspects of inflammation including leucocyte chemotaxis, adhesion molecule expression and leucocyte-endothelial adhesive interactions, production of eicosanoids like prostaglandins and leukotrienes from the n-6 fatty acid arachidonic acid, and production of inflammatory cytokines. In addition, EPA gives rise to eicosanoids that often have lower biological potency than those produced from arachidonic acid and EPA and DHA give rise to anti-inflammatory and inflammation resolving mediators called resolvins, protectins and maresins. Mechanisms underlying the anti-inflammatory actions of marine n-3 fatty acids include altered cell membrane phospholipid fatty acid composition, disruption of lipid rafts, inhibition of activation of the pro-inflammatory transcription factor nuclear factor kappa B so reducing expression of inflammatory genes, activation of the anti-inflammatory transcription factor peroxisome proliferator activated receptor g and binding to the G protein coupled receptor GPR120. These mechanisms are interlinked, although the full extent of this is not yet elucidated. Animal experiments demonstrate benefit from marine n-3 fatty acids in a range of models of inflammatory conditions including arthritis, IBD, MS and endotoxemia. Human trials demonstrate benefit of oral n-3 fatty acids in some inflammatory diseases, with the strongest evidence in arthritis and some evidence in a number of other diseases. There is growing interest in whether these effects of marine n-3 fatty acids may be useful in the chronic low-grade inflammation that accompanies cardio-metabolic disease.

13. Nutrition status and supplementation of undernourished patients with tuberculosis in Kapkatet County Hospital, Kericho County

Sambu Cheruiyot, Gilbert Kibet

Background: Despite national progress on increased access to care and treatment of patient with tuberculosis, malnutrition remains a challenge and TB still remain a major cause of mortality in undernourished patients. In Kenya today Nutrition is a core component in care and treatment of TB patients as under nutrition lower immunity leading to more complications. Currently nutrition supplements supporting TB patients target only severe acute malnutrition with BMI less than 16 leaving other undernourished.

Objective: To evaluate nutrition status of TB patients attending Kapkatet sub-county hospital in Kericho county

Methodology: Retrospective review of Patients who presented to the TB clinic for care and treatment from January 2015 to August 2015 were assessed for nutritional status. Two nutritionist were assigned to assess all patients seeking care and treatments in TB clinic and documented in the nutrition service registers (MOH 407A). BMI was the main anthropometric assessment used.

Results: From the findings, undernutrition was at 90%. Those with BMI < 16 were 15% while majority (85%) had a BMI of between 16 and 18.5. Only those with BIM < 16 were supplemented with FBF and RUTF supported by AMREF. All benefited from pyridoxine, vitamin A supplementation and Nutrition counseling regardless of their nutrition status.

Conclusion: Structured nutrition assessment and counseling is critical in addressing malnutrition in TB patients. There is need to continuously support all undernourished TB patients with (BMI < 18.5) in terms of nutrition supplementation rather than supporting only those with BMI < 16. Regular and timely supply of nutrition supplements is needed.

14. Nutrition status among health care providers at Kapkatet District Hospital in Kericho County

Sambu Cheruiyot, Gilbert Kibet

Background: BMI less than 18.5 kg/m2 indicates undernutrition while BMI of greater than 25 kg/m2 indicates risk of overweight and obesity with a high risk of type 2 diabetes mellitus and cardiovascular diseases (KNGN,2006). Although BMI for staff and clients was done and documented, information was not available on Nutritional status of health care providers in the hospital.

Objectives: To assess nutritional status of health care providers by use of BMI to establish current trend in nutrition status and risk of NCDs.

Methods: A retrospective review of nutrition records was done for health care providers who volunteered for nutrition assessment between; May 2013 – November 2014. Nurses, clinical officers, nutritionists, medical officers and others providers were assessed. MOH 407A was used as a source document to extract data. The BMI results were presented in frequencies and proportion. The relationship of variable nutritional status and gender was established using STATA software.

Results: A total of 200 health care providers were assessed in Nutrition clinic during the review period. 10% had normal BMI, 5% being under weight while 30% were overweight and 55% were obese. 65% of the providers were female (n=130) the rest were male; of the providers who were obese, 10% were male, 90% were female.Among the overweight providers (n=60), 70% were female while 30% were male. Obesity was 85% among female and 40% among male. There was a positive correlation between Nutritional status and the gender (P < 0.0001). Those with normal BMI (n=20), males were 80% while 20% were female. None of the underweight was female.

Conclusions: Nutrition intervention is critical not only for patients but for everyone. All health care providers should plan for nutrition care process. Routine screening for NCDs is equally important. Over-nutrition predisposes clients to NCDs hence health care providers should be role models.

15. Babyfood group update of the South African food composition database: Highlights from data quality checks

Joelaine Chetty, Averalda van Graan, Malory Links

Introduction: Accuracy of capturing nutrient data for inclusion into a country-specific food composition database is an ongoing process together with quality control of data received from food industry.

Aim: The aim was to assess data quality of nutrient information provided by baby food companies, to identify nutrient quality challenges, when uploading into the reference South African food composition database.

Methods: Nutrient data was recorded as received from baby food companies (n=7), for proximates, selected minerals and vitamins. Missing data identified were imputed, captured and recoded for all food codes for 175 food components. A 14 point quality check list was applied to 305 food codes generated for baby foods group. Checklist challenges were addressed individually across food group. Assumptions recorded for each food code where nutrient data was imputed, calculated or predicted.

Results: Total of 305 baby products were captured in reference database. A 12.5% withdrawal of products from company resulted, leaving off pack label data sourced (n=97) and chemically analysed (n=170) labels. Imputations from similar or matched foods occurred in 32% of label data. Moisture values were borrowed from similar foods, for all label data. Of the minimum labelling information of 7 nutrients collected for energy, protein, fat, carbohydrate, dietary fibre, total sugar and sodium; missing data were reported for total sugars, dietary fibre and sodium (63%, 18% and 1.3%, respectively).

Conclusion: Moisture values are important for food compilation calculations and predictions. Challenges with missing nutrient data in food composition databases impacts overall data quality of dietary intake studies.

Key words: missing data, food composition, baby foods, food labelling, South Africa

16. Food labelling legislation: Sodium analysis challenges for food composition database compilation

Joelaine Chetty, Averalda van Graan, Malory Links, Karin Carstensen

Introduction: In South Africa, R.146/2010 currently enforces labelling of food products on the market, whilst R.533/2012 regulates the sodium reduction in various foodstuffs. Accredited laboratories are available nationally for chemical analyses.

Aim: The study aimed to explore data variances amongst two accredited laboratories over a four year period for sodium analyses in selected baby food products from a commercial retailer.

Methods: Chemically analysed data was sourced from a commercial retailer who provided certificate of analyses from two accredited laboratories. Nutrient data values were compared for both stage 1 and 2 baby food products (from 6months) for 36 nutrients. Sodium values were repeatedly analysed annually by the two laboratories, and sodium information for the 4 year period was observed for both types of baby foods.

Results: Levels of uncertainty for sodium reported at laboratories was 0.01. Intra-laboratory ranges for the stage 1 food product sodium value was recorded between 2.2mg and 12mg. The inter-laboratory differences for stage 2 food product, ranged between (5.4 - 15.6)mg and (1.9-10.4)mg, respectively; over the 4 year period. No mean values were recorded over the four year period, only latest analysed sodium value was included in the reference food database.

Conclusion: Analyst error and experience, variations amongst food products, or changes in food matrices could account for both intra-and inter-laboratory ranges noted for sodium. Proficiency testing plans for accredited laboratories are suggested for various food matrices for sodium analysis. Database users need to understand that food composition data are variable data and not be considered as absolute values.

Key words: sodium, food labelling, baby foods, food composition

17. Effect of zinc fortified water on the fatty acid status of Beninese children: A randomized controlled trail

Tsitsi Chimhashu, Linda Malan, Jeannine Baumgartner, Paul van Jaarsveld, Valeria Galetti, Diego Moretti, Michael Zimmermann

Introduction: It is believed that zinc acts as a co-factor in fatty acid (FA) metabolism. Zinc supplementation in zinc deficient rats is known to affect their FA status, but little is known on the effect of zinc fortification on the FA status of humans.

Objectives: The aim of this study was to assess whether daily consumption of zinc fortified water had an effect on the plasma FA composition of Beninese children.

Methodology: A 20-week double-blind randomized controlled trial was conducted in Beninese school children aged between 6 and 10 years, n = 385. They were randomly assigned to receive either a daily portion of zinc-fortified filtered water delivering 2.8 mg Zn (Zn+filter) and non-fortified filtered water (Filter). Plasma total phospholipid FA composition was determined in a subsample using capillary gas-liquid chromatography. The effect of zinc fortification on the endpoint plasma FA composition was performed by using ANCOVA with baseline plasma FA status and plasma zinc as covariates, Zn+filter n=24 and Filter n = 32.

Results: Children who consumed zinc fortified water had an improved plasma long-chain polyunsaturated FA (LCPUFA) composition when compared to controls at endpoint. The children in the zinc+filter group had higher docosahexaenoic acid (DHA, 22:6 n-3) and arachidonic acid (AA, 20:4 n-6), both $p < 0.001$; and linoleic acid (LA 18:2 n-6), $p= 0.005$.

Conclusion: Our results indicate that zinc fortification with a low dose of highly bioavailable zinc from filtered water improves the plasma total phospholipid LCPUFA composition of children with a poor zinc status.

Key words: fatty acids, zinc, zinc fortification

18. From research to policy to behaviour change – the journey of Salt Watch

Christelle Crickmore, Vash Mungal-Singh

Purpose: Reducing salt intake to less than 5g per day is regarded as a best buy to prevent non-communicable diseases and hypertension. Since South Africans consume too much salt (6 – 11 g/day) and processed foods acount for 55% of current salt intake, legislation was passed in March 2013

and has come into effect on 30 June 2016 limiting salt content in a basket of commonly consumed foods. Furthermore, South Africans consume high levels of discretionary salt, making a public education programme necessary to facilitate behaviour change.

Methods: The Salt Watch (SW) coalition was formed comprising of academia, government, industry and healthcare and led by the Heart and Stroke Foundation SA. The SW working group reviewed the literature, global initiatives and consumer insights regarding salt reduction to identify successful strategies. SW consulted with national and global experts, a marketing agency, and multisectoral stakeholders to develop a public awareness campaign. Pre- and post-surveys were implemented to determine the effectiveness of the campaign. A review of the global progress on salt reduction to date provides further insight regarding the next steps on the South African journey.

Findings: It was agreed that the public education and awareness campaign requires a multisectoral, collaborative approach, one that is innovative and takes into consideration SA's diverse socio-economic and cultural differences. The campaign consisted of a mass-media campaign strengthened by various supporting activities to provide additional information and educational material regarding salt reduction.

The campaign was launched in 2014 with television and radio advertising featuring a celebrity doctor in conjunction with a call to the dissemination of basic, clear and consistent messages by all stakeholders and sectors.

Conclusion: Salt reduction in South Africa requires a two-pronged approach of both policy intervention as well as continued consumer education. The SW campaign made use of a multi-sectoral, collaborative approach, evaluated its efforts and continues to lobby multiple sectors and stakeholders.

Evaluation of our efforts are key and together with global insights should guide government, researchers and other stakeholders' response to the rising hypertension rates in South Africa.

19. Does intake of oily fish and n-3 LCPUFA affect children's cardiometabolic health?

Camilla T. Damsgaard

Most countries recommend an intake of about 2-4 servings of fish weekly. Hereof typically half should be oily fish, an important dietary source of n-3 long-chain polyunsaturated fatty acids (LCPUFA). However, few children and adults meet these fish intake recommendations. Consumption of fish and n-3 LCPUFA seems to reduce cardiovascular disease mortality in adults and although randomized trials administering oily fish to adults show mixed results, fish oils consistently reduce blood pressure, heart rate, and plasma triacylglycerol in adults. Along with the obesity epidemic cardiometabolic derangements such as hypertension and dyslipidemia are increasingly seen in children and show tracking into adulthood. This is also a concern in countries like South Africa where the growing double burden of malnutrition and overweight may have consequences for children's cardiometabolic health. Observational studies indicate that consumption of fish and n-3 LCPUFA in childhood is associated with a more beneficial cardiometabolic profile, but associations may differ in boys and girls. The few previously conducted randomized trials with fish oil to young children and adolescents indicate that n-3 LCPUFA may lower blood pressure and plasma triacylglycerol in children as in adults. However, the effects of oily fish intake on children's cardiometabolic health have not been investigated. In order to fully clarify the cardiometabolic potential of fish and n-3 LCPUFA intake in childhood, we need well-designed randomized controlled trials that investigate this in different child populations and take into account potential effect-modification by gender and genotype.

20. A qualitative study exploring factors which affect the food choices of the elderly (>60years) in Chobe District, Botswana

Obert Dengende

Background: Elderly people in low income settings such as Botswana rely on low quality diets that contribute to poor nutritional status.

Malnutrition and poor nutritional status contributes to disease burden by worsening pre-disposition to disease and lengthening recovery. There is an added risk of Non-communicable diseases. Healthy dietary patterns are a fundamental component of preventive strategies targeting chronic non-communicable disease in the elderly people.

Aim: The aim of this study was to explore factors influencing food choices in the elderly in Chobe District Botswana in order to make recommendations for healthy public policy development and implementation.

Methods: Using interpretivism and social constructionism epistemological approach, semi-structured interviews were conducted to uncover and explore lay perspectives on factors affecting food choices in the elderly population. Purposeful sampling was used to recruit 12 elderly participants above 60 years of age for individual interviews. Thematic content analysis was used to explore factors influencing food choice for these participants.

Results: Three core themes of `resources`, `ability` and `nourishment` were identified. `Resources` spoke about overarching socioeconomic factors influencing food choice in the elderly participants. "Ability" spoke of ability of participants to be able physically and mentally provide food for themselves and understand importance of food choice. "Nourishment" spoke of physical things that participants gained from food or thought were important.

Conclusion: Campaigns that incorporate tailored advice that include practical solutions on socio-economic and resource availability coupled with active community participation are likely to succeed in facilitating dietary change and healthier food choices.

21. Attitudes, knowledge, perceptions and experiences of elite coaches about the implementation of sound nutrition practices

Nicki de Villiers, Gerda Gericke

Background: Coaches are a frequent source of nutrition information for athletes, irrespective of inadequate nutrition knowledge.

Aim: To determine the knowledge and attitudes of elite coaches in South Africa and describe their perceptions and experiences during the implementation of nutrition practices in athletes.

Methods: A mixed method approach was used. A phenomenological approach was used in the qualitative domain through focus group discussions. The quantitative domain used a cross-sectional descriptive approach by employing a standardised questionnaire. Fourteen coaches coaching on provincial and/or national level were included in the study.

Results: The mean percentage of correct (47.3%), incorrect (24.8%) and unsure (27.3%) knowledge scores confirmed poor nutrition knowledge amongst coaches in spite of an overall positive attitude.

Coaches valued the role of nutrition in performance, mentioning optimal energy provision; avoidance of symptoms and injury; weight manipulation; and immune support. Coaches identified several information sources, including health care professionals; fitness personnel; fellow coaches; reading material; sporting federations; and coaching courses. They commented on the scientific nature of message delivery that hindered practical application. In spite of feeling incompetent, coaches still engaged in nutrition education for athletes. Perceived facilitators towards behavioural change in athletes included self-regulation methods; planning; performance results; support systems; and role models. Perceived barriers included inadequate knowledge and skills; financial constraints; food availability; social influences; and absence of visible results. Coaches express the need for further nutrition education.

Conclusion: Frequent contact between athletes and coaches presents an opportunity for nutrition education. Coaches should therefore be equipped to assist athletes towards optimal nutrition practices.

22. Nutrition knowledge, attitudes, perceptions and experiences of elite athletes about the implementation of nutrition practices

Nicki de Villiers, Gerda Gericke

Background: The role of nutrition in sport has been well established. In spite of nutrition education attempts, athletes still lack knowledge, and eat inadequate diets that could hinder performance. Previous research exploring athletes' nutrition knowledge and attitudes lacked consideration of an athlete specific context.

Aim: To determine the knowledge and attitudes of South African elite athletes and describe their perceptions and experiences during the implementation of nutrition practices.

Methods: A mixed method approach was used. A phenomenological approach was used in the qualitative domain through focus group discussions. The quantitative domain used a cross-sectional descriptive approach by employing a standardised questionnaire. Eighty athletes partaking in various sporting codes on provincial and/or national level were included.

Results: Athletes showed poor nutrition knowledge but positive attitudes. Main themes identified were the perceived value of nutrition; information sources; experiences regarding message delivery and behaviour change; facilitators and barriers to behavioural change and education needs. Energy balance; meal regularity and timing; and hydration were valued. Nutrition information sources were criticised regarding the lack of credibility thereof. Athletes reflected on negative experiences regarding nutrition message delivery and contributing factors thereto. They commented on personal lack of behavioural change and competence in practical application. Facilitators and barriers to behaviour change related to the influence of friends, fellow athletes and family. Further education on performance enhancement; weight management and food choices were requested.

Conclusion: It seems apparent that athletes need assistance to implement nutrition knowledge into sustained dietary practices to support optimal performance.

23. Exploring stakeholder commitment and capacity to address infant and young child nutrition in the Breede Valley, Western Cape Province, South Africa

Lisanne du Plessis, Milla McLachlan, Scott Drimie

Experience and evidence exist on multi-stakeholder processes (MSPs) at a global - and national level about how to build and assess commitment and capacity to address infant and young child nutrition (IYCN). Little experience and documented evidence exist for such processes at local level.

A qualitative study design and selected participatory research methods were used. Semi-structured interviews with 27 key stakeholders were held to explore their perspectives, commitment and capacity concerning IYCN. Hereafter, during a workshop, stakeholder relationships and power related to IYCN governance were mapped. Lastly, focus group discussions were conducted to reflect on the research process. Main themes from the overall research findings include: the value of local knowledge and information; appeal of the first 1000 days messages and its links to development; the urgent need for IYCN advocacy; value of stakeholder engagement and seeing the broad IYCN stakeholder landscape; the need for multi-sectoral work, while recognising the difficulty in functioning across sectors; realising the capacity inherent in "people" as a resource, need for a "whole of society approach" in advancing the IYCN agenda and the importance of strategic capacity in local forums, combined with national legislation, to advance action for IYCN. A detailed exploration of initial stages of a MSP is a valuable practice - and research model to create awareness of IYCN as a development issue of crosscutting importance at implementation level. Such an approach, appropriately adapted to local conditions, could be helpful in scaling-up efforts to improve IYCN at sub-district level elsewhere in the country.

24. Food Security of Students at NMMU

Annelie Gresse, Liana Steenkamp, Ingrid Oxley-Oxland

Background: Food insecurity is a major multi-faceted problem with no clear solutions at South African universities. Researchers found that food insecurity is worst in specific demographic sections of students.

Aim: Food insecurity was investigated at the Nelson Mandela Metropolitan University as part of a multi-discipline descriptive survey to determine the extent of the problem and find solutions.

Methods: A convenience sample of registered students (n=815; 38.3% male), participated in an electronic or hard copy descriptive survey in 2015. Approval for a follow-up and comparison of a study done in 2013, was obtained. Frequencies and percentages were used and sub-groups were compared using the Pearson chi-squared test ($p < 0.05$).

Results: On average 25.82% of students indicated that they sometimes and 12.5% often do not have enough food, with no significant difference between males and females and students of various years. In the 30 days before the study, 14.6% were without food for two days or more. Coping mechanisms vary, but 50.4 % indicated that they borrow money. Most money is spent on food and travelling. Most students cook for themselves and buy food from the local supermarket. Significantly more students who do not always have enough food ($p < 0.05$, 70.11%) stay in hostels or in communes.

Conclusion: In comparison with nearly 46% of the students who indicated a lack of food in 2013, less students reported a lack food in this study. The preventative actions of the NMMU may play a positive role, but the problem still needs more attention.

25. Label Compliance of High-Protein Sports Supplements to Inform Regulations

Nicolette Hall, Hettie Schonfeldt

The study evaluated label compliance of high-protein sports supplements. An extensive list of protein supplements available on the South African market was populated by the research team (n=110) through a survey conducted at the leading supplement retail-groups and online stores. 70 products were selected for testing. Convenience sampling was performed at undeclared retailers. Two samples of each product with different batch numbers was independently purchased on different days. Two randomly coded duplicate samples were analyzed at a SANAS accredited laboratory. Results obtained were statistically compared to that presented on the product labels through a two-sample statistical unequal variance (heteroscedastic) t-Test, with a two-tailed distribution. Percentage difference between the analysed values and the value declared on the label was explored. Skim milk powder, whey powder and values from the Agricultural Product Standards Act No. 119 of 1990 were also included.

Protein content differed significantly ($p < 0.05$) from labels for 48 products (68.6%). Recommended tolerances for nutrient declarations in nutrition labelling are regulated by the Guidelines of the Regulations Relating to the Labelling and Advertising of Foodstuffs for Compliance Purposes (Guideline 5, R.146 of 1 March 2010). Five products tested outside the regulated tolerance value of 25% for protein, and warrants further investigation. The remaining 65 products analysed were in-line with the tolerance value, with percentage differences between the analysed means and protein label values ranging between 0.5% and 24%. The use of specific conversion factors for nitrogen to protein, in addition to the generally accepted factor of 6.25, was also explored.

26. A therapeutic group-based programme is more effective than usual care for weight loss in obese patients attending a primary health care facility in Cape Town

Janetta Harbron, Kathryn Manning, Marjanne Senekal

Introduction: The high prevalence of obesity and non-communicable diseases (NCDs) in the public sector is concerning.

Aim: To compare the impact of a six-week facility based therapeutic group (FBTG) programme with usual care on weight loss in obese patients, with NCDs or risk factors for NCDs, attending a public hospital in Cape Town.

Methods: A quasi-experimental study design was used. Patients chose to receive treatment with the FBTG programme (n=96) or usual care (n=97). The FBTG programme comprised of a one-on-one dietetic consultation, followed by weekly group sessions for six weeks. Current usual care involves a one-on-one dietetic consultation. Socio-demographic variables, blood pressure, smoking status, weight, height, waist circumference, physical activity and stage of change were collected. Within-group changes over 6 months were compared between treatment groups using linear models. For weight change, per protocol analysis and intention-to-treat (ITT) analysis were conducted.

Results: There were no significant differences at baseline between the two groups. FBTG patients experienced greater (p=0.002) reductions in weight (mean(SD) of -2.8(4.9)kg) over six months than usual care patients (+0.2(9.7)kg). Waist circumference reduction was greater in FBTG (-3.7(5.2) cm) than usual care (-0.6(4.6)cm) patients ($p < 0.001$). More FBTG patients participated in formal physical activity (p=0.008) and reached the weekly target of 150 minutes (p=0.009). More FBTG (74%) than usual care (49%) patients were in the action stage of change by six months (p=0.010).

Conclusion: This group-based intervention was more effective than usual care in reducing weight and waist circumference, and improving physical activity levels and stage of change.

27. Nutrition above the Neck: Essential Fatty Acids in Mental Health

Joseph R. Hibbeln

2015 Dietary Guidelines for Americans acknowledged for the first time that nutrition might impact mental health outcomes. They found that "Healthy" and "Mediterranean" dietary patterns might reduce burdens of neuropsychiatric illness, however, only studies with dietary pattern data were assessed. Fortunately, abundant studies evaluating specific foods and their nutrients have become available in the 18 years since the publication of the ecological association between lower risks of major depression in countries with greater fish consumption [1]. The quality of data linking greater consumption of fish and omega-3 fatty acid will be evaluated on multiple levels: ecological studies, meta-analyses of epidemiological studies [2], meta-analyses of case control tissue compositional studies [3], and meta-analyses of randomized controlled trials [4]. The beneficial biological mechanisms of action appear to impact multiple biological systems. Central to these may be neuroimmunological mechanisms that induce dysfunction of the serotinergic, dopaminergic neurotransmitter systems regulating reward processing and increase stress reactivity of the hypothalamic- pituitary-adrenal "stress" axis [5]. Deficiencies in omega-3s cause serotonin levels to be reduced by nearly 50% in frontal cortex in animal studies, and in human studies, lower levels of plasma DHA correlate to lower levels of CSF 5-HIAAA [5]. Strong and consistent evidence supports benefit of omega-3 fats in depression. Mediterranean dietary patterns of olive oil and fish consumption are good models for achieving adequate tissue composition of the omega-3 highly unsaturated fatty acids docosahexaenoic acid (DHA) and eicosapentaenoic acid (EPA). Traditional Mediterranean diet patterns resemble the low levels of intake (~2 % of calories) of omega-6 fatty acids (linoleic acid, LA) found in dietary patterns achievable from foods available during hominid evolutionary periods [6]. Reducing LA intakes to 1-2% of calories allows endogenous production of EPA and DHA from terrestrial oil sources of a-linolenic acid. We have recently assessed if there would be harm (increased risk of cardiovascular death) from lowering dietary intake of LA by recovering and reanalyzing data from two large randomized controlled trials the Sydney Diet Heart Study [7] and the Minnesota Coronary Experiment[8]. In both studies high LA oils did succeed in lowering serum cholesterol, but this lowering in cholesterol was associated with an increased risk of cardiovascular death, not the protection intended.

References

1. Hibbeln, J.R., *Fish consumption and major depression.* Lancet, 1998. **351**(9110): p. 1213.
2. Li, F., X. Liu, and D. Zhang, *Fish consumption and risk of depression: a meta-analysis.* J Epidemiol Community Health, 2016. **70**(3): p. 299-304.
3. Lin, P.Y., S.Y. Huang, and K.P. Su, *A meta-analytic review of polyunsaturated fatty acid compositions in patients with depression.* Biol Psychiatry, 2010. **68**(2): p. 140-7.
4. Hallahan, B., et al., *Efficacy of omega-3 highly unsaturated fatty acids in the treatment of depression.* Br J Psychiatry, 2016.
5. Hibbeln, J.R. and R.V. Gow, *The potential for military diets to reduce depression, suicide, and impulsive aggression: a review of current evidence for omega-3 and omega-6 fatty acids.* Mil Med, 2014. **179**(11 Suppl): p. 117-28.
6. Crawford, M.A., et al., *Evidence for the unique function of docosahexaenoic acid during the evolution of the modern hominid brain.* Lipids, 1999. **34 Suppl:** p. S39-47.
7. Ramsden, C.E., et al., *Use of dietary linoleic acid for secondary prevention of coronary heart disease and death: evaluation of recovered data from the Sydney Diet Heart Study and updated meta-analysis.* Bmj, 2013. **346**: p. e8707.
8. Ramsden, C.E., et al., *Re-evaluation of the traditional diet-heart hypothesis: analysis of recovered data from Minnesota Coronary Experiment (1968-73).* BMJ, 2016. **353**: p. i1246.

28. Prelacteal Feeding Practices and Associated Factors in a Nigerian rural setting

Adenike Oluwayemisi Jimoh, Sunday Adaji, Hamdalla Adelaiye, Abiola Aira Olorukoba, Comfort Garba, Anita Lukong, Suleiman Idris, Umma Bawa, Sunday Oladapo Shittu

Introduction: Initiation of breastfeeding within an hour of childbirth is strongly recommended by the World Health Organization for health, social, emotional and even economic benefits. Prelacteal feeding hampers breastfeeding and limits these benefits and therefore not recommended.

Aim: To assess prelacteal feeding practices and its associated factors in a rural community with the view to generate useful baseline data for planning community-level interventions to promote early initiation of breastfeeding and safe infant feeding practices.

Methods: This was a cross-sectional, community-based survey using questionnaires on hand held devices running on Android Operating System. Trained female interviewers collected the data over a period of one week in 2011.

Results: The majority (85.2%) of respondents utilized prelacteal feeds for their newborns. Plain water was the most common (44.7%). Prelacteal feeding was associated with home births (AOR 2.794, 95%CI 1.070 - 7.298), births not assisted by a skilled birth attendant (AOR 2.661, 95%CI 1.096 - 6.458), and having had an operative procedure during delivery (AOR 6.937, 95%CI 2.433 - 19.78). We found no statistically significant association between use of prelacteal feed with women's age, education and access to income.

Conclusion: Prelacteal feeding is still practiced in rural communities despite proven negative effect on breastfeeding and the consequences on newborn health. Promotion of safe infant feeding practices needs to be re-invigorated and specially targeted at rural women in low and middle income countries.

Key words: Prelacteal feeds, Breastfeeding, Women, Newborns, Rural community

29. Relationship between Child Development and Nutrition: A Cross-Sectional Study of Under-Five Nigerian Children

Adenike Oluwayemisi Jimoh, Jane Oowo Anyiam, Alhassan Mela Yakubu

Introduction: The interplay between nutrition and child development cannot be overemphasized especially in developing countries.

Aim: To determine the relationship between developmental quotient and nutritional status of under-fives in Nigeria.

Methods: A cross sectional study involving 415 under-fives aged 6-59 months in selected pre-schools and immunization centres. Developmental assessment was done using the Schedule of Growing Skills II (GL Assessment Ltd., London). The nutritional status was assessed using the WHO growth charts for weight-for-age, weight-for-height and height-for-age. Chi square and odds ratio with 95% confidence interval were used to determine the association between nutritional status and selected developmental domains.

Results: The mean age was 32.6±15.9 months. The male to female ratio was 1.2:1. The overall prevalence of developmental delay was 35.4%, with manipulative domain accounting for the highest delay (25.8%). The prevalence of stunting, wasting and underweight was 9.1%, 3.8% and 3.8% while 2.2% were overweight. Weight-for-age had significant association with hearing and language domain ($\chi 2 = 4.42$, $p = 0.036$; OR= 3.3, 95% CI: 1.1-9.7) and interactive social domain ($\chi 2 = 11.28$, $p = 0.001$, OR= 5.0, 95% CI: 2.0-13.0).

Conclusion: The nutritional status of a child has effect on certain developmental domains of that child. There is therefore a need to intensify efforts to improve our infant and child feeding practices and improve on child development programmes with close monitoring and routine screening for developmental delay at regular intervals.

Key words: Developmental quotient, Nutritional status, Domain, Delay, Child

30. Anaemia and associated anthropometric variables among women in the rural Free State, South Africa

Marizeth Jordaan, Corinna Walsh, Louise van den Berg, Cornel van Rooyen

Introduction: Obesity and anaemia remain global public health problems. Optimal nutritional status remains important in ensuring optimal health of women, particularly women of childbearing age.

Aim: To determine body composition, anaemia prevalence, contraception use and associations in rural women, 25–49 years, in the Free State, South Africa.

Methods: A cross-sectional descriptive study design was applied in a sample of 134 women. Anthropometric variables were measured according to standard techniques and included weight, height (to calculate body mass index), waist circumference as well as triceps, biceps, subscapular and suprailliac skinfolds (to calculate body fat percentage). Blood samples were collected according to standard techniques and analysed for full blood counts, transferrin saturation, ferritin, homocysteine and red cell folate. Contraceptive use information was obtained with a questionnaire.

Results: Median body mass index (BMI) (28.7kg/m2), waist circumference (90.8cm) and body fat percentage (38.8%) were among unhealthy ranges. Only 1.5% had iron deficiency and 0.7% suffered from iron deficiency anaemia. Homocysteine levels were high in 7.5% of women, with 3.8% presenting with low red cell folate levels. More than half (54.1%) reported that they regularly menstruate and almost three quarters (71.6%) used injectable contraceptives. Significant associations were found between median MCV, MCH levels and transferrin saturation across categories of BMI, waist circumference and body fat percentage. Medians for these parameters decreased with increasing adiposity levels.

Conclusion: A predominant pattern of malnutrition, characterised by overweight and obesity, particularly abdominal obesity, and unhealthy body fat percentages were prevalent. Risk for iron deficiency was associated with obesity.

Key words: Anaemia, iron, iron deficiency, iron deficiency anaemia, folate, overweight, obesity

31. Association of access to traditional/indigenous foods, household dietary diversity and food security in Botswana

Salome Kasimba, Boitumelo Motswagole, Nicole Claasen, Namukolo Covic

Introduction: Botswana is food secure, and follows a food security strategy that focuses on economic access not adequate national food production. Traditional and indigenous foods (TIFs) are visibly available and sold by street vendors, but knowledge on the association of access to TIFs with household dietary diversity (HHDD), household food insecurity and BMI has not been investigated.

Method: A random household cross-sectional survey (n=400) was conducted. Food access and insecurity were assessed using the FAO HHDD Scores and FANTA Household Food Insecurity Access Scale (HFIAS), respectively. Access to TIF was determined from HHDD data. One woman's BMI (Kg/m-2) per household was determined where present (n=253). Spearman correlations were assessed for these variables.

Results: There was a positive correlation between number of TIFs accessed and HHDD scores (R=0.457; $p < 0.001$) and a negative correlation between the number of TIFs accessed and HFIA scores (R=-0.272; $p < 0.001$). There were no correlations between number of TIFs accessed and women's BMI. It was found that 11.5, 81.0 and 7.5% of households fell into low (0-4), medium (5-8) and high (9-12) HHDD categories, respectively. Prevalence of mild, moderate and severe food insecurity were 14.0, 28.8 and 37.3% and prevalence of underweight, overweight and obesity was 4.0, 15.1, and 15.1%, respectively.

Conclusion: The observed associations of greater access to TIFs with higher dietary diversity and better household food security status warrants further investigation towards informing policy development and public health nutrition messages.

Key words: Indigenous/Traditional food access, Household dietary diversity, Household food security, Botswana

32. The influence of nutrition labelling and logos on food purchasing behaviour in the City of Cape Town, Western Cape, South Africa

Nelene Koen, Renee Blaauw, Edelweiss Wentzel-Viljoen

Introduction: Non-communicable disease burden can be addressed through population-wide interventions, including the promotion of healthy diets through the provision of adequate nutrition information on food labels. This study aimed to determine the nutrition label knowledge, use and understanding of consumers and the impact of nutrition labelling on purchasing behaviour.

Methods: In this cross-sectional descriptive study an interviewer-administered electronic survey was conducted on adult consumers (primary household food shoppers) (n=960) at 16 randomly selected grocery stores (including the four major food retailers) in four health districts of the Cape Metropole.

Results: Only 36.0% of consumers indicated that they often read nutrition information on food labels, while 27.8% specifically read the nutrition information table, 29.1% the list of ingredients and 32.7% the nutrient content claims. Two-thirds (67.8%) were not able to recognise any health endorsement logo and 59.5% indicated that they prefer one standard logo to be used. The mean nutrition labelling knowledge score was 44.4%, with those that often read nutrition labels, having a significantly higher knowledge score ($p < 0.01$). The three main factors influencing food purchasing behaviour included price (93.9%), sell by date (92.2%) and products on special or promotion (93.8%).

Conclusion: Consumers have poor nutrition label knowledge and do not regularly read nutrition information on food labels. This could explain why nutrition label information was not mentioned as an important determinant of food purchasing. More should be done to educate consumers on utilising nutrition labelling to make healthier food choices and to simplify food labels for consumers.

33. Assessing food and nutrition security of Stellenbosch University main campus undergraduate students

Liesbet (HE) Koornhof, Lisanne M du Plessis, Maritha L Marias, Lynette C Daniels

Nutrition insecurity has been reported at South African universities. This study assessed whether Stellenbosch University (SU) undergraduate students, living in university or private accommodation also experience nutrition insecurity/hunger. A cross-sectional, study with an analytical component was executed by means of an electronic survey.

Established, validated tools, i.e. Food and Nutrition Technical Assistance Project Household Hunger Scale and Food and Agriculture Organisation Diet Diversity guidelines were adapted to assess nutrition security of students. Data obtained via the electronic was transferred to an Excel datasheet and analysed with Excel and STATA.

A response rate of 13% (n=2158) of 14 502 undergraduate students was obtained. More females (62%) than males participated. The majority of respondents were first years; 45% were living in private accommodation and 41% in student residences whilst 14% lived with their parents. Fifteen percent responded having than R500 per month for living expenses. Lack of resources to get food affected 15%, whilst 11% of students reported going to bed hungry and 3% of students reported going a full day and night without eating anything due to not enough food available. A significant relationship between hunger and type of accommodation (P=0.04).Relationships between food shortage due to lack of resources and gender (P= 0.007), year of study (P=0.047), and source of student fees (P=0.001) were significant. The mean DDS for undergraduate students was 5.22 (Standard deviation = 1.78).

Hunger potentially impacts students' academic performance negatively. Nutrition insecurity exists amongst SU undergraduate students and requires appropriate measures to address the problem.

34. Agreement between body mass index and percentage body fat categories in black South African women

Salome Kruger, Chrisna Botha-Ravyse, Lize Havemann-Nel, Maretha Doubell

Introduction: Percentage body fat (%BF) is a more physiological measure of adiposity than body mass index (BMI) and is associated consistently with adverse health outcomes.

Aim: To investigate the agreement between adiposity classified by BMI and %BF categories, respectively, in black South African women.

Methods: Black women aged 29-65 years (n=435) from Ikageng, South Africa were included in this cross-sectional study. Socio-demographic and health questionnaires were completed. Body weight and height were measured and BMI was calculated, while %BF was measured using dual-energy X-ray absorptiometry (DXA). The proposed %BF cut-off points for non-Hispanic black women to predict adiposity corresponding to BMI ≥ 25 kg/m² is 35.8% for the age group 29-49 years and the cut-off point for age ≥ 50 years is 37.7%.

Results: The prevalence of combined overweight/obesity according to the international BMI standards (BMI ≥ 25 kg/m²) was high at 76.8%. There were significant agreements between the presence of high %BF and combined overweight/obesity (BMI ≥ 25 kg/m², $x^2 = 199.0$, $p < 0.0001$; $\kappa = 0.68$, $p < 0.0001$), as well as between the presence of high %BF and obesity only (BMI ≥ 30 kg/m², $x^2 = 129.1$, $p < 0.0001$; $\kappa = 0.48$, $p < 0.0001$).

Conclusion: A stronger agreement existed between BMI categories and %BF at a cut-off point of 25kg/m² than at 30kg/m². Adult South African black women may be considered to have excessive body fat at a BMI ≥ 25 kg/m².

35. A theory based nutrition education programme for primary school teachers in the Bronkhorstspruit district, Gauteng: process evaluation

Mojisola Kupolati, Una MacIntyre, Gerda Gericke

Introduction: Process evaluation measures the progress of programme activities and reveals whether the programme was implemented as planned. Process evaluation was applied during the implementation of a nutrition education programme (NEP) in the Bronkhorstspruit district.

Objective: To assess the implementation of a theory based contextual NEP within the existing curriculum of the Department of Basic Education (DoBE) by teachers.

Methods: Teachers (n=10) of nutrition in Grades 4 - 7 in one of the primary schools were trained to implement the NEP during a one day workshop. The teachers' comments on skills and knowledge acquired during the workshop were obtained through a questionnaire. The NEP was implemented by Grade 5 and 6 teachers (n=5) during the 2015 academic year. One-to-one interviews using Likert type questionnaires were conducted with the teachers on completion of each of the five topics of the NEP. The teachers explained their experiences in using the NE materials. Data were expressed as frequencies. Interview data were described in terms of completeness, fidelity, dose and reach.

Results: The teachers felt they enhanced and acquired new skills and knowledge for teaching nutrition. All NE topics were implemented, but not as planned due to time constraints. Implementation fidelity was low. The dose of the NEP delivered was 100% but the dose received by the learners was low; ranging from 9% to 50%. The NEP implementation reached all the learners.

Conclusions: It was feasible to implement a NEP within the existing DoBE curriculum; however time for effective implementation was a challenge.

36. A theory based nutrition education programme for primary school teachers in the Bronkhorstspruit district, Gauteng: impact evaluation

Mojisola Kupolati, Una MacIntyre, Gerda Gericke

Introduction: Impact evaluation provides answers to how much change occurred due to an intervention.

Objective: To assess the impact of a theory based contextual nutrition education programme (NEP) on the nutrition knowledge, attitudes and dietary practices (KAP) of teachers and learners.

Methods: A NEP was implemented using a quasi-experimental design in two schools in the Bronkhorstspruit district. A total of 23 teachers who taught nutrition in Grades 4 - 7 (treatment school, n=11) and 681 learners (treatment school, n=350) participated in the study. Teachers' nutrition KAP was assessed by self-administered questionnaires, and learners' KAP by standardised nutrition KAP questionnaires administered with assistance at pre- and post-implementation. Data were analysed using a Generalised Least Squares regression, P = 0.025 for a one-tailed test.

Results: At post-implementation, the treatment school teachers' total nutrition knowledge mean score (85.5 ± 8.2%) was significantly higher than that of the control school (P=0.003). The mean scores of the total nutrition knowledge (53.2 ± 16.9%) and nutrition attitudes (63.9 ± 19.7) of the treatment school learners were significantly higher than those of the control school learners (P=0.003; P=0.001). The nutrition attitudes and the dietary practices of the teachers and the dietary practices of the learners in the treatment school showed no significant improvement compared with the control school (P > 0.025).

Conclusions: The NEP led to the improvement in the teachers' and the learners' nutrition knowledge and the learners' nutrition attitudes. However no improvement in the dietary practices of both the teachers and the learners was found.

37. The accuracy of arm-associated height estimation methods compared to true height, KwaZulu-Natal, South Africa

Christen Lahner

Introduction: Stretch stature is the gold standard for measuring true height, but when this is not possible height estimation methods are used.

Aim: To determine the accuracy of arm-associated height estimation methods used for the calculation of true height compared to stretch stature in a multi-racial group of 900 young South African adults, situated in KwaZulu-Natal, South Africa.

Methods: A cross-sectional descriptive survey was conducted among

Black (n=300), White (n=300), and Indian (n=300) subjects, aged 18 to 24 years, of both genders. Trained fieldworkers measured anthropometric measurements including stretch stature, total armspan, half-armspan, and demi-span. These measurements were then entered into height estimation equations such as the World Health Organisation (WHO) equation, half-armspan multiplied by two, and the demi-span gender-specific equations.

Results: Anthropometric variation was identified between race groups as well as between genders. The anthropometric variation could be described by the maximal height theory and the Vitruvius theory. Arm-associated height estimation methods can be used in the young South African adult population to estimate true height. However, each method is specific to race and gender: (i) Black males, the WHO-adjusted equation; (ii) Black females, the demi-span female equation; (iii) White males, the total armspan; (iv) White females, the total armspan; (v) Indian males, the demi-span male equation; and (vi) Indian females, the WHO-adjusted equation.

Conclusions: This study's findings provides a baseline for future height studies to be conducted on the South African population, where each anthropometric method should be validated for each race and gender.

38. Major nutrient patterns and the cardiovascular risk factors of rural and urban men and women from 2005 to 2010 - The PURE study

Sarie Lee, Christine Taljaard, Chrisna Ravyse, Tertia van Zyl, Edelweiss Wentzel-Viljoen, Marike Cockeran, Ria Laubscher

Introduction: The prevalence of cardiovascular disease (CVD) is increasing in developing countries. Studies have shown that dietary intakes have a definite relationship with CVD.

Methods: Data from rural and urban populations in the PURE study from 2005 and 2010 were used. Nutrient pattern scores were derived using principal component analysis. Multivariate analysis was conducted to examine the independent longitudinal associations between nutrient pattern scores and CVD risk factors, using a mixed linear regression model.

Results: For urban men the most prevalent pattern was animal protein and fat driven for both 2005 to 2010. In 2005 a significant increase in waist circumference was the only risk factor associated with the pattern, in 2010 a practical significance in the reduction of total cholesterol was observed. In urban men no influence on the risk factors were observed for the same pattern. Also noteworthy in the 2005 male rural population is that the plant protein, carbohydrate and fibre pattern (second most prevalent) was associated with lower CVD risk, ↓LDL (p=0,008), ↓LDL (p=0,001) and ↑HDL(p=0,000). In urban women the pattern changed from plant protein, carbohydrate and fibre to animal protein and fat in 2010 and a practically significant change in the systolic blood pressure was observed. The plant protein, carbohydrate and fibre pattern in rural women showed no statistically significant associations, but there was practical significant change in ↓HDL, ↑LDL, ↑triglycerides, ↑BMI.

Conclusion: Results indicate little change in the dietary patterns over time, but the CVD risk factors are still influenced by these patterns.

39. Analytical determination of baby food moisture content for enhanced composition data quality: A pilot study

Malory Links, Siyazama Nomnayi, Joelaine M Chetty, Averalda E van Graan

Moisture content is a major determinant of a food's nutritional quality and important in compilation of quality compositional data. In the event of missing data, moisture values are often matched with similar foods or could be calculated based on the solid ingredients listed on the food's nutrient label. The reliability of imputed and calculated data is often questionable and can result in nutrient data of lower quality. SAFOODS mission is to deliver accurate, reliable and validated food compositional information, thus the aim was to determine food specific analytical moisture values for South African baby foods.

Stratified sampling was used to obtain commercially available baby foods (n=31) representing seven major food groups. The gravimetric method was used to determine moisture contents. Duplicate samples were oven dried at 105°C for 3 hours. Analytical moisture values were compared with matched and calculated values.

Analytically determined moisture values for jar foods ranged between 80 and 92%, while the calculated values ranged between 79 and 94% and the matched values ranged between 82 and 89 %. Additionally, 36 % (n = 11) of the moisture values obtained by calculation for jar foods were underestimated, while 64% (n=20) of matched values were underestimated. Calculated cereal moisture values were overestimated by on average 54%.

Analytically determined moisture values remains the most reliable source of moisture content information. However, calculated moisture values appeared to be more accurate at estimating moisture content of jar foods compared to matched values, while matched values were more accurate for baby cereals.

40. Anti-oxidant and Anti-inflammatory activities of Athrixia phylicoides (bush tea) blended with commercially and non-commercially teas

Florence Malongane

Introduction: Oxidative stress and inflammation is a known risk factor in the pathogenesis of conditions such as diabetes mellitus and cardiovascular diseases. Different teas and herbs have various bioactive constituents with different anti-oxidant and anti-inflammatory activities. When taken together, the mixtures could yield a synergistic effect or potentiate the effect of another. The aim of the study was to determine the synergistic effect of bush tea with commercial or non-commercial herbal teas in reducing the activities of the pro-inflammatory enzymes and increasing anti-oxidant activities.

Method: The anti-inflammatory activities of the extracts were determined by measuring the inhibitory effect of the extracts on the activities of the pro-inflammatory enzyme, lipoxygenase. The antioxidant activities of methanol:dicloromethane (1:1 v/v) and water extracts were determined by measuring the free radical scavenging activity using the 2,2-diphenyl-1-picrylhydrazyl (DPPH) method.

Results: Water extracts of Chamomile tea had good antioxidant activity with IC50 values of 65.53 µg/mL, followed by Monsonia burkeana with IC50 of 74.86 µg/mL compared to that of the positive control ascorbic acid (91.25 µg/mL). The metabolism of linoleic acid to leukotriene derivatives by 15-lipoxygenase (15-LOX) was not effectively inhibited by both crude water extracts and methanol:dicloromethane extracts of selected teas except for water extract of combined Monsonia burkeana and Athrixia phylicoides (IC50 = 79.10 µg/mL).

Conclusion: Monsonia burkeana is an indigenous herbal tea that has shown anti-oxidant properties and its combination with Athrixia phylicoides was the only combination found to inhibit pro-inflammatory enzyme, lipoxygenase. The results strengthen the need to explore South African indigenous teas.

41. Evaluation of properties of zein-corn starch films prepared in presence and absence of transglutaminase

Kingsley Masamba

Introduction: The use of biodegradable films is highly favoured over synthetic films because of benefits related to environmental protection and low cost. However, biodegradable films are usually characterized by poor mechanical and water barrier properties hence requiring approaches to address the shortcomings.

Method: In this study, composite films based on zein and corn starch were produced in the presence and absence of transglutaminase. Two concentrations of corn starch at 5% and 10% were used making the final solid concentration of 6% in the zein-corn starch film forming solutions. Enzyme induced cross linking and zein-corn starch interactions were verified by molecular weight distribution analysis. Mechanical and water barrier properties of films were assessed using standard procedures.

Results: The use of transglutaminase in both control zein and composite films improved mechanical properties with respect to tensile strength (TS) while films produced in the absence of transglutaminase in composite films exhibited better water vapour permeability (WVP). The highest TS of 25.2MPA and low WVP of 0.33 (g mm m-2 h-1 kPa-1) were registered in transglutaminase cross linked zein and composite films containing 10% corn starch prepared in absence of transglutaminase. Mechanical properties were improved by transglutaminase while the use of composites in absence of transglutaminase improved water barrier properties.

Conclusion: The use of both transglutaminase and composites can improve both mechanical and water barrier properties of zein-corn starch composite films.

Key words: zein, corn starch, transglutaminase, mechanical properties, water barrier properties

42. Exclusive breastfeeding practices and anthropometric status of 0-6 months infants in Vhembe District, Limpopo Province

Tirhani Asnath Masia, Tjale Cloupas Mahopo, Cebisa Noxolo Nesamvuni, Tshifhiwa Ratshikombo, Mapula Innocentia Pome, Ronewa Debra Mudau

Introduction: Feeding practices have an impact on growth and health status of children. The World Health Organisation recommends that infants be exclusively breastfed for the first six months of life.

Aim: To determine exclusive breastfeeding practices and anthropometric status of infants aged 0-6 months in Vhembe District, Limpopo Province.

Methods: The study used descriptive cross-sectional study and quantitative method. The study population comprised of 150 infants (54.7% girls and 45.3% boys) aged 0-6 months. Participants were conveniently selected from two clinics of Vhembe District. Questionnaire was used to collect data and analysed using descriptive analyses.

Results: The age of mothers of infants ranged from 19 to 42 years. Fifty-eight percent of mothers had secondary and 22.7% had tertiary education. Only 40% of mothers were employed. Breastfeeding initiation was done in almost all infants (94.7%) and 82% were still breastfeeding. No infant exclusively breastfed for six months. However, very few infants (18%) were exclusively breastfeed for three months. Formula milk was also given to 5.3% of infant immediately after birth. Early introduction of non-breastmilk substitutes was also reported before the first three months. Not having enough milk (10%) and mother going to school/work (6.6%) were the main reasons for early introduction of non-breastmilk substitutes. Stunting (34.4%) was more prevalent than obesity (29.9%), underweight (25.3%) and wasting (2.6%) in the study.

Conclusion: Exclusive breastfeeding for six months still remains low in the rural communities. Prevalence of malnutrition is still of concern in the study.

Key words: exclusive breastfeeding, formula feeding, anthropometric status

43. Consumers knowledge on salt information

Hlekani Vanessa Mbhatsani, Elekanyane Mahandana

Objectives: The main aim of the study was to determine consumer's knowledge on salt information.

Methodology: A descriptive and exploratory study was conducted among male and female consumers aged 18 years of age and above residing in a rural village within Thulamela municipality, in Vhembe district, of Limpopo in South Africa. The research type was both qualitative and quantitative in nature. The researcher conveniently selected one individual male or female who was a full time resident of the village and not a visitor. A researcher administered questionnaire was used to collect data using the local language. Anthropometric measurements of weight and height, were taken as well as blood pressure. Data was analysed using Statistical Package for Social Science version 23. Descriptive statistics were used to interpret the information gathered and presented in the form of tables and figures.

Results: The study findings suggested that a majority 95% of consumers were unaware of the recommended daily intake of salt. Few 16.7% consumers indicated that they check salt content on food products before buying. With regards to consumers' ability to accurately interpret nutrition information on food products, only 26.6% were able to do so. The respective prevalence of overweight (15% vs 10.1%) and obesity (25% vs 10%) among the female consumers was higher than that of their male counterparts (10.1% vs 10%). The blood pressure measurements revealed that about 30.1% of consumers are have high blood pressure while the self-reporting data indicated that only 7% are hypertensive.

Conclusion: It is concluded that consumers have low knowledge on salt information based on the researcher's discretion. In addition more female consumers were overweight and obese as opposed to their male counterparts. However, a majority of consumers had normal blood pressure.

44. Iodine Status of Pregnant Women and Children Aged 6 to 12 Years

Eric Mabasa, Solomon Mabapa, Pieter Jooste, Xikombiso Mbhenyane

Objectives: The aim of the study was to assess iodine status of pregnant women and children aged 6 to 12 years feeding from the same food basket in Mopani district.

Design: A descriptive, exploratory and cross sectional survey was conducted.

Setting: Forty one primary health care clinics randomly selected five municipalities of Mopani District in Limpopo Province.

Subjects: A total of 565 purposively selected pregnant women and 116 children aged 6-12 years were recruited.

Outcome measures: Urinary Iodine concentration, TSH levels, water and salt iodine concetration; Demographic characteristics and nutrition knowledge. The Sandel-Kolthoff method with microplate reading of the end point was used for iodine analyses in urine and water whiles the iodometric titration method for salt analyses at the iodine laboratory of the Medical Research Council. Demography and nutrition knowledge were determined using a researcher administered validated questionnaire.

Results: The maternal overall median UIC level was 164µg/L indicating maternal iodine sufficiency. However, median UIC in the first and third trimesters was below 150µg/L, indicating iodine insufficiency. Most children (64.3%) had UIC level greater than 300µg/L (median=386µg/L) indicating excessive iodine status. The findings showed that 52.5% of household salt had iodine concentration level more than 15ppm. The median iodine concentration of drinking water in Mopani District was 46.2µg/L. The TSH levels of majority of pregnant women were normal.

Conclusion: Iodine status of both pregnant women and children in this study was sufficient with UIC for children excessively high, more than two times higher than the iodine status of pregnant women.

Key words: iodine deficiency, urinary iodine concentration, pregnant women

45. Food Consumption Patterns of West African Immigrants Residing in Gauteng Province: Preliminary Findings

Tulisiwe Pilisiwe Mbombo-Dweba, Christian Anayochukwu Mbajiorgu, James Wabwire Oguttu, Adelaide Agyepong

Introduction: Migration often leads to the loss of what is known as "Healthy Immigrant Effect" due to adoption of unhealthy eating habits upon resettlement in host countries.

Aim: To describe the current food practices of West African Immigrants residing in Gauteng Province, South Africa.

Methods: A cross-sectional study was adopted to collect qualitative and quantitative data from a convenient sample of 50 West African female immigrants. A questionnaire and a 3-day food recall was used to examine the number of times none "West African food" was included in the diets. Data was analysed using SPSS (version 23) and summarized using descriptive statistics. Chi-square was used to compare adoption and non-adoption. Associations between adoption of South African food and the following variables (age, marital status, qualification, employment, household income, duration of stay) were tested using Fisher's Exact Test.

Results: A significant difference (p=0.007) was observed between adoption (70%) and non-adoption (30%). Three patterns of dietary acculturation emerged: strict continuity with original food culture (30%); limited adoption (40%) and very limited adoption (30%) of South African foods. Based on the 3-day food recall, majority (48%) followed strictly traditional eating patterns, 26% included non-traditional foods once in 3 days while 18 % included non-traditional foods more than once in 3 days. No associations were observed for all the factors tested ($p > 0.005$) with $p < 0.005$.

Conclusion: Traditional food still features prominently in the eating patterns of West African immigrants. Traditional food should therefore be included in nutrition interventions and education programmes directed at this group.

46. Associations between Birth Weight And Nutritional Status in Children Below 2 Years of Age in Motherwell, Nelson Mandela Bay

Ashlea Meade, Shawn McLaren, Liana Steenkamp, Phumeza Mkontwana, Danie Venter, Joyce Nyarko

Introduction: Malnutrition in young children continues to be a major health concern for South Africa. Research into factors like Low Birth Weight (LBW) contributing to wasting, stunting and underweight should be encouraged.

Aim: To determine associations between birth weight and nutritional status in children below two years of age in Motherwell, Nelson Mandela Bay Health District.

Methods: In this cross-sectional study, a sample of 419 children aged 0 to 24 months was selected from the 20 clusters identified using convenience sampling (Ethics approval: H15-HEA-DIET-002). The weight, length and mid-upper-arm circumference (MUAC) of participants were measured by trained fieldworkers. Birth weights were recorded from the Road-to-Health Booklet. WHO Anthro software was used to determine z-scores and statistical analysis was conducted on the 388 complete anthropometric data sets. Group means of the birth weight categories were compared using Student's t-tests.

Results: Of the 388 participants 22 (5.7%) had a LBW. LBW children had a significantly ($p < 0.0005$) lower mean weight-for-age Z-score of -0,64 (SD=1.64) compared with 0,50 (SD=1.21) in normal birth weight (NBW) children. A significantly lower mean height-for-age Z-score (HAZ) was also observed for LBW (-1,81; SD=1.81) children compared to NBW (-0,16; SD=1.24) children. No significant differences were demonstrated between groups in terms of wasting.

Conclusion: A low birth weight is associated with increased risk of stunting, but not wasting, in children. Prevention of low birth weight infants is therefore necessary in addressing malnutrition and strategies for its reduction should include maternal health as a priority.

47. Infant feeding practices and factors associated amongst mothers of infants aged 0 to 12 months in Soshanguve clinics

Suzan Mokone, Mashudu Manafe, Estelle Viljoen

Introduction: A cross sectional study was conducted in six Soshanguve clinics. The study sample was n=325 of mothers with infants 0- 12 months.

The purpose of the study was to assess different infant feeding practices and their promoting factors among mothers of infants aged 0- 12 months in Soshanguve clinics.

Methodology: Quantitative descriptive design was used to investigate different infant feeding practices and their promoting factors. The questionnaire was divided into four sections, Section A gathered demographic data, Section B & C gathered infant feeding practices and

associated factors and Section D gathered complementary feeding data.

Results: A total of 325 questionnaires were analysed for the study. Majority (83.6%) of mothers were breastfeeding their infants. Prevalence of exclusive breastfeeding at < 1 month was 81% but declined to 13% at 6 months. Mixed feeding was practiced by breastfeeding mothers, increased from 2.6% (< 1month) to 71% (6 months). Reasons given by mothers for not practising EBF up to 6 months were the following: the right age of introducing solids foods, crying babies, going back to work, not having enough breastmilk, painful nipple, medical reasons, culture and advice from others. Predominant factors that were found to significantly influence breastfeeding were mothers' educational status, maternal age and employment status.

Conclusion: The results confirm low rate of exclusive breastfeeding in Soshanguve clinics (13%) at 6 months.

Key Words: Exclusive breastfeeding, breastfeeding, formula feeding, mixed feeding, factors associated with feeding practices, complementary feeding

48. Developing the strategy for prevention and control of obesity: South Africa's experience

Lynn Moeng-Mahlangu

Introduction: Obesity is one of the major public health concerns facing South Africa and the prevalence of people affected has been on the incline. The prevalence of overweight and obesity is at 65.1% and 31.2% for women and men respectively. The key drivers to obesity span from poor infant feeding practices, poor diet, insufficient physical activity and lack of knowledge. It against this backdrop the National Department of Health recognised the need to develop the strategy for prevention and control of obesity.

Method: The process started with multi-sectoral consultation in July 2014 and the strategy being approved in 2015. The complex and multi-causal nature of obesity warranted lobbying for support and involvement of various stakeholders,each uniquely influencing the landscape of the obesorgenic environment.

Results: The developed strategy has six broad goals which are 1)creating an institutional framework to support inter-sectoral engagement; 2)create an enabling environment that supports the availability and accessibility to healthy food choices in various settings; 3)increase the percentage of the population engaging in physical activity; 4) support obesity prevention in early childhood; 5)communicate with;educate and mobilise communities and 6) establish a surveillance system and strengthen research relating to obesity.

Conclusion: South Africa has committed to 10% reduction in obesity by 2020. A multi-sectoral approach is imperative to start curbing the prevalence of obesity.

49. Introducing micronutrient powders (MNP) into the Public Health System: A case study of KwaZulu - Natal, South Africa

Lenore Spies, Sthandiwe Monegi, Zamazulu Mtshali

Objectives: To assess the acceptability & feasibility of the introduction of MNP into the current public health system in KwaZulu- Natal, South Africa to inform provincial policy.

To assess the adequacy of training provided, distribution, storage and reporting model to inform provincial policy.

Methods: A cross sectional descriptive survey following the implementation of the pilot project which distributed 4856984 x1g sachets of MNP to 88 878 children between 6-24 months of age. Fifty percent (n=5) of the piloted districts were targeted. Semi structured questionnaires were admitted to 50 project implementers. Semi-structured group discussions were held with 18 groups (n=125) of community implementers. Focus groups discussions were held with 18 groups of caregivers (n=66) of MNP recipients.

Results: There was a high level of acceptability of the product amongst project implementers (93%). Positive responses were received from caregivers reporting improvement in appetite and general wellbeing of children. The majority of respondents (70 – 81%) reported no problem with regards to delivery, storage, distribution, stock control and reporting. Training for implementers and clarity on the age of the targeted group was listed by implementers as factors that require improvement.

Conclusion: Micronutrient powders have not been used at a public health level in SA. The evaluation of the pilot project in KZN demonstrated that some operational adjustments need to be made to the project, before it could be scaled up for policy development and provincial implementation. The evaluation established the acceptability of micronutrients powders by implementers & recipients.

50. Nutritional status of children with Wilms' Tumour on admission to a South African Hospital and its influence on outcome

Lauren Moore

Background: In developing countries the prevalence of malnutrition on admission amongst children with cancer can reach 69%. High rates of malnutrition occur due to factors such as poverty and late presentation. Weight can be an inaccurate parameter for nutritional assessment of patients with solid tumours as it is influenced by tumour mass. This study aimed to assess the prevalence of malnutrition amongst subjects with Wilms Tumour (WT), the level of nutritional support received on admission, and the influence of nutritional status on outcome.

Methods: Seventy six children with WT admitted to Inkosi Albert Luthuli Central Hospital between 2004 and 2012 were studied prospectively. Nutritional assessment took place before starting treatment and included weight, height, Mid Upper Arm Circumference (MUAC) and Triceps Skinfold Thickness (TSFT). Outcome was determined at two years after admission. Time until commencement of nutritional resuscitation, and nature thereof, were recorded.

Results: Stunting and wasting was evident in 12 and 15% of patients respectively. By including MUAC and TSFT, the prevalence of malnutrition was 57%. Malnutrition was not a predictor of poor outcome and did not predict advanced disease. Eighty four percent of patients received nutritional resuscitation within 2 weeks of admission.

Conclusion: Nutritional assessment in children with solid tumours should include MUAC and TSFT. Malnutrition at the time of admission was not shown to be related to poorer outcome after two years. This may be due to the effects of early aggressive nutritional resuscitation as part of management by a multidisciplinary team, although numbers are small.

51. Micronutrient Supplementation to Fatigue management for The Water Crisis Crew in Maluti a Phofung

Dineo Mopeli, Magda Botha, Joerien Swanepoel

Introduction: Maluti a Phofung Municipality had been experiencing critical water shortage since November 2015. The residents of Maluti a Phofung have almost all been affected by a complete shutdown. Water tankers are used to supply different communities and institutions with water for daily use. The crew working in the disaster include water transporters as well as Joint Operations Centre members who are meeting daily to monitor and manage the disaster.

Method: Crew Members were interviewed regarding their eating habits and how the crisis had affected their food intake. The focus was on their usual eating habits, sleeping patterns, their role in the water crisis as well as whether they were taking any nutritional supplementation. 98% of the crew indicated that their eating pattern has changed due to the crisis management, 87% of which showed a decrease in food intake due to lack of time. The signs of fatigue experienced were identified as 92% of the crew indicated sleeping 3 to 6 hours per day. All members were put on Nutrition supplementation using fortified porridge, 100 g per day for a period of at least 3 months.

Results: The outcome of supplementation yielded a massive decrease in fatigue symptoms.

Conclusion: Nutrition Supplementation is critical in disaster management considering the changes in food intake and high levels of fatigue during crisis management.

Key words: Nutrition supplementation, fatigue management, disaster management, water crisis

52. Prevalence and trend of under nutrition, overweight and obesity in children and adolescents in Kenya, Tanzania and Uganda

Regina Nakiranda, Per E Gustafsson

Introduction: The world faces the dual burden of malnutrition both under nutrition and over nutrition which coexist especially in low and middle income countries. This is attributed to the economic development and nutrition transition. The rise in stunted, overweight and obese children and adolescents in low and middle income countries creates an additional stretch to the already burdened health systems with limited resources in place. The objective of this scoping review was to provide an overview of the recent literature that examined prevalence and trend of under nutrition, overweight and obesity in children and adolescents in Kenya, Tanzania, and Uganda in the last fifteen years.

Methods: This study was conducted as a scoping literature review of studies carried out the past fifteen years from 2000 to 2015 in Kenya, Tanzania and Uganda. A systematic literature search using electronic databases of PubMed, Google Scholar, and Africa Index Medicus was done. Twenty three observational population-based quantitative studies which reported prevalence of overweight or under nutrition in children and adolescents of 17 years, and nine reports from demographic surveys were included. All studies used the objective measures of body composition such as weight, height, and body mass index basing on National Center for Health Statistics or new World Health Organization reference standards.

Results: This scoping literature review showed that, the three countries are experiencing overlapping forms of both undernutrition and overweight problem in children and adolescents. The prevalence of stunting and underweight ranged from 6.6-52% and 5.3%-30% respectively however it's decreasing overtime from the reviewed studies while the prevalence of overweight/ or obesity ranged from 3%-22% and it showed there was evidence of shift from underweight to overweight in the recent years in children and adolescents.

Conclusion: Childhood under nutrition is still a major problem in the three countries. However, the overweight problem also exists though not well explored in three countries. We recommend more nationally representative studies to address this gap. This will guide the policy makers and governments on how to allocate their scarce resources in order to address these nutritional challenges. More efforts are needed to reduce the childhood under nutrition especially stunting and also prevent childhood overweight and obesity before reaching the epidemic levels. Public health programs and policies must be able to address both ends of the malnutrition spectrum, and intervene appropriately.

Key words: under-nutrition, overweight, obesity, children, adolescents, prevalence

53. Food-based Dietary Guidelines: methods used to synthesise evidence and grade recommendations

Phillipa Blake, Solange Durao, Celeste Naude, Lisa Bero

Background: Evidence-based guidelines are informed by systematic reviews and use structured consensus frameworks to rate recommendations. Given methodological advances there is a need to evaluate methods used to develop dietary guidelines for population health.

Objective: To describe the methods used for evidence synthesis and grading of recommendations in food-based dietary guidelines (FBDGs).

Methods: We hand-searched the Food and Agriculture Organization's (FAO) FBDGs database (14 January 2016). The latest versions of FBDGs in any language were included if they were published from 2010 onwards; aligned with the WHO guideline definition; and aimed at the general population. We extracted information on: country; publication date; type of evidence reviewed; methods used to conduct systematic reviews, rate recommendations, and manage conflicts of interest (COI). Data extraction issues were resolved through discussion.

Results: We included 30 of 79 eligible FBDGs (18 English, 12 other languages). Most were based on other countries' guidelines (16/30) and published systematic reviews or reports (13/30). Three guidelines commissioned systematic reviews. Most reported methods used to define evidence review questions (28/30), but few reported methods used to search (5/30), extract data (2/30), evaluate methodological quality (6/30), or synthesise evidence (1/30). Most used consensus to rate recommendations (27/30). Few reported COIs (4/30) or funding sources (9/30).

Conclusion: Our study highlights discrepancies in FBDG development across countries and a dependence on other countries' guidelines likely due to resource constraints. Governments and research organizations should implement efficient, explicit and reproducible methods for dietary guideline development that balance rigour and pragmatism.

54. Malnutrition-related morbidity and mortality in HIV-exposed infants of mothers enrolled in the PMTCT programme at a Namibian district hospital: the role of infant feeding practices

Casper Tarumbwa, Celeste Naude, Lisanne du Plessis, Lynette Makura

Background: Optimal infant feeding practices are critical to the prevention-of-mother-to-child-transmission (PMTCT) of HIV. Multiple, complex factors influence infant nutrition, emphasizing the need for appropriate interventions to prevent malnutrition, especially in these vulnerable populations.

Aim: To examine the association between infant feeding practices (birth-24 months) and related socio-demographic, socio-economic and medical factors, and risk of morbidity and mortality from malnutrition in HIV-uninfected babies born to HIV-infected mothers.

Methods: In a case-control design, HIV-uninfected infants born to PMTCT programme-enrolled mothers (January 2011 to January 2013) were randomly selected from maternity records at a district hospital in Namibia. Cases comprised infants who suffered morbidity or mortality from malnutrition, and controls, infants born during the same period, but not suffering morbidity or mortality from malnutrition. Of 97 identified mother-infant pairs, 82 (27 cases, 55 controls) could be located and consented to participate.

Results: Binary regression analysis showed that for every one year increase in mother`s age, the odds of being a case decreased by 36% (p=0.067; 95%CI 0.396 - 1.031) and for every one unit increase in socio-economic status score, the odds of being a case decreased by 29% (p=0.062; 95%CI 0.499 - 1.017). There was a six-fold increase in the odds of being a case for every one additional infant born before the current infant (p=0.074; 95%CI 0.837 - 45.981). Every additional month of breastfeeding reduced the odds of being a case by 83% (p=0.014; 95%CI 0.043 - 0.697).

Conclusions: PMTCT programmes should focus on breastfeeding education, family planning and maternal socio-economic circumstances.

55. Iodised salt and iodine supplements for prenatal and postnatal growth: a rapid scoping of existing systematic reviews

Jessica Farebrother, Celeste Naude, Liesl Nicol, Maria Andersson, Michael Zimmerman

Introduction: Iodine deficiency can adversely affect child development including growth. However, the effect of iodine supplementation/fortification on prenatal and postnatal childhood growth is unclear, and a rigorous systematic review could contribute to this evidence base. To avoid duplication and inform a possible new review, we undertook a rapid scoping of existing systematic reviews.

Methods: We searched two electronic databases (15 December 2014). All English systematic reviews (of experimental or observational studies) reporting iodine supplementation/fortification (any form, dose, regimen) for iodine-related health outcomes (including but not limited to growth), in pregnant or lactating women or children to age 18, were included. Duplicate extracted data allowed examination of the scope of questions, including: author, publication year, most recent search date, participants, pre-specified treatment/exposure and comparator, pre-specified outcomes and those relevant to our question, number and type of studies included. Methodological quality was assessed using the validated AMSTAR tool.

Results: 976 records were screened and 10 reviews, mostly of moderate methodological quality, included. Outcomes included thyroid function, iodine deficiency disorders, mental development and growth in pregnant women, preterm infants and children into adulthood. Although five reviews pre-specified growth outcomes, none provided synthesised evidence on effects of iodine supplementation or fortification on prenatal and postnatal somatic growth.

Conclusions: Our rapid scoping demonstrated a gap in the evidence with no up to-date systematic reviews on the effects of all forms of iodine supplementation/fortification in relevant populations on growth and growth-related outcomes. A new systematic review examining this question will assist in addressing this gap.

56. Food safety indicators in rural Venda household food security measurements

Cebisa Nesamvuni, Andre Dannnhauser, Bennie Viljoen, Gina Joubert

Introduction: Food safety, although included in the definition, is not measured in most surveys of food security. This could be an important missing factor in the quest for reliable food security data.

Aim: To investigate food safety indicators in rural Venda household food security measurements.

Methods: A cross-sectional study was undertaken in 335 rural households from Thulamela local municipality. Various food safety indicators were measured together with commonly used food security indicators. Numeric data was described using means and standard deviations or medians. Frequency distributions were used to describe categorical data. Food safety variables found to be univariately significantly associated with specific household food security variables were considered for inclusion in the logistic regression model, with stepwise selection of variables. A step by step analysis was done during the development process of food safety indicators, in which indicators that did not show significant associations with food security indicators and did not show sufficient variation were eliminated.

Results: Household food insecurity was indicated in all dimensions of food security tested. Of the food safety indicators, food handling practices and knowledge seemed acceptable. Poor microbial quality was detected in > 94% of stored and handwashing water and 75.9% food samples. Food handling practices, stored water and communal handwashing practices had significant associations with food security indicators.

Conclusion: Food handling practices, stored water and communal handwashing practices were rural household food safety indicators suggested for inclusion.

Keywords: Household food security, food safety indicators, microbial quality.

57. Predict value of foetal malnutrition, poverty, multiple infections, residence, gender and ethnicity of abdominal obesity among under 5 years Black children in Elundini local municipality, Eastern Cape

Sibusiso Nomatshila, Benjamin Longo-Mbenza, Thelmah Maluleke

Background: The burden of obesity is well known among adult Black South Africans with nutrition transition. However, there is no data on child obesity at Elundini local municipality, Eastern Cape Province, South Africa. The aim of the study was to estimate prevalence and predictors of abdominal obesity.

Method: This cross-sectional study was conducted in crèches from Elundini local municipality, Eastern Cape, South Africa between 13 February 2012 and 05 April, 2012. Potential predictors were foetal malnutrition (Low Birth Weight = LBW < 2500g and Macrosomia = Ma > 4000g), post birth weight, height, residence, gender and ethnicity, actual micronutrient deficiency, multiple infections and family income. Abdominal obesity defined by waist circumference (WC) ≥ 52 cm (75 percentile), dependant variable, was predicted using multivariate logistic regression analysis.

Results: Out of 461 children aged 3-5 years, 47.9% (n=221), 52.1% (n=240), 15.2% (n=70), 2.6% (n=12), and 58.8% (n=271) were males, females, LBW, Ma, and with abdominal obesity respectively. After adjusted for confounders (gender, multiple infections and income) using logistic regression, only LBW (OR=9; 95% CI 1.3 – 6; P=0.026), semi-urban areas (OR=6; 95% CI 1.2-3; P=0.032), and vitamin A deficiency (OR=1.5; 95% CI 1.1 – 2.2; P=0.023) where the most important and significant independent predictors of abdominal obesity.

Conclusion: Abdominal obesity is an emerging epidemic among semi-urban children with poverty, and oxidative stress at future high risk of non-communicable diseases at Elundini local municipality.

58. Implementation of integrated child and women's health interventions in Capricorn District, Limpopo Province

Rebone Ntsie

Introduction: According to the South African health calendar, August month is declared as a month to commemorate both child and women's health. Commemoration takes place in various ways. In 2015, to commemorate child and women's health month, the National Department of Health (NDOH) adopted an integrated approach to highlight and increase the awareness and demand for the high impact and cost –effective proven child and women healthcare interventions which aim to end preventable deaths.

Methods: Capricorn District held preparatory meetings with stakeholders to develop an action plan. The plan focused on awareness creation and healthcare interventions. Awareness campaigns on breast and cervical cancer screening were conducted through health education in Primary Health Care (PHC) facilities and radio talk shows. Early Childhood development Centres (ECDCs) were visited for immunization, Vitamin A administration, deworming administration and Mid Upper Arm Circumference (MUAC) measurements in children.

Results: A total of 120 ECDCs were visited and more than 8000 children were offered health services. Although the recommended coverage levels of ≥80% was not reached for all indicators, there was a significant increase in coverage for measles 2nd dose (93.9%), vitamin A dose (72.3%), deworming dose (62.6%) and cervical cancer screening (88.1%). These coverage percentages were the highest for the year 2015/16.

Conclusion: Collaboration with other stakeholders and an integrated approach should be used when implementing child and women healthcare interventions. These activities should be conducted at least once every quarter especially because there were no financial costs incurred since only available resources were used.

Keywords: integrated, child health, women's health, awareness, healthcare, interventions, coverage

59. Nutrient Intake adequacy and Nutritional Status of the Elderly in Obafemi-Owode Local Government Area, Abeokuta. Ogun State

Catherine Oladoyinbo, Adenike Bamidele, Abimbola Sobo

Background: Poor dietary intake is a risk factor for malnutrition among the elderly. The aim of this study is to assess the adequacy of nutrient intake and nutritional status of the elderly in Obafemi Owode Local Government Area, Ogun State.

Method: The cross-sectional study was conducted among 372 respondents. Information on bio-data was collected. A multi-pass 24hour dietary recall was used to assess dietary intake, Anthropometric measurements were taken using standard equipment. Adapted Total dietary assessment software was used to analyze dietary intake data, descriptive statistics and chi-square were done using SPSS version 20.

Result: Thirty-nine percent of the respondents were between the ages 51-59years, 51.9% were males and 48.1% were females. One third (39%), 17%, 20.2%, 8.6% and 22% of the respondents had adequate intake of energy, protein, fat, calcium and zinc respectively while excess intake of energy, protein, fat, calcium and zinc was observed among 30.6%, 66.4%, 41%, 5.1% and 52.4% of the respondents respectively. Fifty-two percent were overweight while 39% were obese and 53% of the respondents have excess abdominal fat which is a risk factor for cardiovascular diseases. There was a significant relationship between waist circumference and BMI (P = 0.001) but there was no significant association between energy intake and body mass index of this group (P = 0.976).

Conclusion: The prevalence of overweight and obesity is high and inadequate intake of calcium was observed among the respondents.

Keywords: Elderly, dietary intake, nutritional status, micronutrient intake

60. FAO ENACT (Education for Effective Nutrition in Action) collaboration with the University of South Africa (UNISA): piloting of the ENACT Online course

Catherine Pereira, Tertia van Eeden, Elsmari Nel

Introduction: The FAO ENACT course aims to build working capacity in nutrition education through practical activities, simulated and real. An online version, in development, aims to maintain the course's practical, interactive and experiential features. In its search for a relevant, sustainable and effective nutrition education programme for communities in developing countries, UNISA, a distance education institution, partnered with FAO to pilot the online course. Three stipulations underpin the project: it should train potential tutors to raise their capacities, improve nutrition education competences of participants, and contribute directly to the promotion and institutionalisation of the course.

Methods: Three lecturers collaboratively participated in the online tutor

training programme with support from FAO. Phase two consisted of training approximately 15 participants in South Africa to use the online tool over a five-month period.

Results: The pilot process was comprehensively documented and collaborative recommendations were made relating to implementation period, scope and contents of the online resources. Recommended actions were provided by tutors, program coordinator and participants. The piloting feedback, given by UNISA to FAO, which necessitated various forms of analysis and problem-solving, will promote program development. It consists of reports on technical and academic observations, including workload, technical issues, content, length, clarity, and assessment, which will enable the course developers to improve the course and to adapt it to UNISA's needs. In addition to nutrition education, participants developed other valuable skills, such as advanced computer literacy.

Conclusions: The FAO ENACT course could be successfully institutionalised for UNISA, provided the recommended adaptations are made.

61. A study of the genetics of type 2 diabetes in African subjects of Zulu descent in KwaZulu-Natal

Fraser Pirie, Ayesha Motala, Imran Paruk, Manj Sandhu, Mark McCarthy

Background: The prevalence of type 2 diabetes (T2D) in African populations in South Africa is rapidly increasing. It is not known if African subjects with T2D have similar genetic susceptibility traits to other populations.

Aim: The study aimed to define genetic markers associated with T2D in a group of African subjects in KwaZulu-Natal, using a genome-wide screening approach.

Methods: Subjects of Zulu descent with T2D and an age of diagnosis older than 40 years were recruited from a number of clinics in the eThekwini Municipality. Control subjects were drawn from a separate study on the epidemiology of diabetes in the same community. DNA was extracted from peripheral blood and genome-wide analysis (GWAS) of single nucleotide polymorphisms (SNPs) was performed at the Sanger Institute, Cambridge, UK, using a customized Illumina Multi-Ethnic Genotyping Array which includes European, Asian, Hispanic, African and multi-ethnic exome content. Samples were imputed up to the 1000 Genomes phase 3 reference panel.

Results: 1602 subjects with T2D were recruited, of whom 1227 (76.6%) were women, mean age 56.4 ± 9.2 years, mean BMI 34.4 ± 7.3 kg/m2 and median diabetes duration 5 years. Control subjects included 976 subjects of whom 677 (69.4%) were women, mean age 37.1 ± 15.7 years and mean BMI 28.4 ± 8.5 kg/m2. Seven variants from previously described T2D susceptibility loci were associated with T2D ($p<0.05$) and showed concordance with other studies; the strongest signal was observed at TCF7L2 ($p=1.0x10-6$). Two loci reached genome-wide significance; rs79276081 intergenic variant ($p=2.5x10-8$) was located outside of known T2D loci and the second (rs6578990) mapped to the INS-IGF2 region ($p=2.5x10-8$).

Conclusions: The study shows T2D genetic susceptibility loci in Zulu subjects similar to those found in other populations, but with additional novel loci identified. The sample size is too small to determine the significance of these loci and requires replication studies in larger cohorts.

62. Development of a comprehensive heart failure management program in a low-resource setting in South Africa

Sandra Pretorius, Nigel Crowther, Simon Stewart, Melinda Carrington, Karen Sliwa

Chronic heart failure (CHF) is a public health problem in South Africa and the role of more effective heart failure management programs that provide individualized treatment plans to CHF patients are receiving considerable attention. However, there are no data to support their use within the developing world. We therefore performed a randomized controlled study of a multidisciplinary CHF management program in Soweto, compared with usual care. A group of 49 consenting, eligible patients were randomized to either usual care or to the study intervention and appropriate nutritional, anthropometric and cardiovascular variables measured at baseline and at 6 months. We found that heart rate was significantly lower at follow-up (89.9 ± 14.6) compared to baseline (93.4 ± 17.2; $p < 0.05$) only in the managed care group. Furthermore, if diastolic blood pressure increased over the follow-up period, ejection fraction fell by 5.98% ($p=0.009$) in comparison to cases where diastolic blood pressure remained the same or fell. Blood vitamin C concentrations were markedly deficient in both standard care [6.53 (3.80, 9.22) µmol/L: normal range 23 – 85 µmol/L] and managed care [3.65 (1.75, 8.23) µmol/L: normal range 23 – 85 µmol/L] groups. In addition, thiamine levels at baseline correlated negatively with systolic blood pressure ($r=-0.68$, $p=0.04$) at follow-up. Although these findings need to be interpreted with caution, they suggest that this CHF management program has positive effects on cardiac recovery following heart failure. Furthermore, we observed that elevated serum thiamine levels predict lower systolic blood pressure suggesting that dietary interventions may improve cardiovascular function.

63. A decade review of the Severe Acute Malnutrition (SAM) Case Fatality Rate (CFR) in Children under 5 in KZN

Nireshnee Reddy, Lenore Spies, Zamazulu Mtshali

Introduction: SAM is the worst form of acute malnutrition and is a significant contributor to child mortality. Management of severe acute malnutrition according to WHO guidelines can reduce the case-fatality rate by 55% in hospital settings. The objective of the review was to determine a trend analysis of the District Health Information System (DHIS) on SAM CFR in children under 5 in KZN. Reference is made to advancements in SAM management over the same period.

Materials and Methods: Using DHIS data, a cross sectional analysis was conducted on the SAM Admission and Deaths of children < 5 years old for the period April 2006 to December 2015. Data was analyzed per district and per facility to establish SAM CFR in the province. Post intervention comparison was done for Zululand District who actively facilitated community based screening for malnutrition in 2015.

Results: The SAM CFR in children under 5 dropped from 17.1% in 2006 to 8.3% by December 2015. The worst performing district (Zululand) reduced SAM CFR from 20.3% in 2014/2015 to 9.0% by December 2015 after conducting community based screening for malnutrition in 1 entire sub district. Facility based analysis was able to identify those hospitals contributing to the CFR in the province.

Conclusions: KZN has made strides in decreasing SAM CFR. Early detection of acute malnutrition, and in patient management of SAM according to WHO Ten Step Protocol contributes significantly to reducing SAM CFR.

64. An analysis of common factors in deaths of children under 5 years old admitted with severe acute malnutrition (SAM) in KZN, South Africa

Nireshnee Reddy, Lenore Spies, Zamazulu Mtshali

Introduction: The UNICEF Conceptual Framework of Malnutrition describes the basic, underlying and immediate causes of malnutrition. With urbanisation and advancements in treatment of HIV/AIDS and TB, the objective was to ascertain the common factors in deaths of children admitted with SAM.

Materials and Methods: A cross sectional comparative study of the common factors in deaths of children under 5 admitted with SAM in paediatric wards was conducted. A standardized questionnaire was designed to capture common factors amongst the deaths of children under 5 admitted with SAM between April and December 2015. All facilities (n=52) admitting children with SAM were targeted.

Results: There was a response rate of 75% (n=39) facilities. A review of 229 deaths was conducted. The highest percentage (69%, n=158) of deaths were related to sepsis, pneumonia or diarrhoea. This was closely followed by poor infant and young child feeding (48%, n=112), and (40%, n=90 were HIV positive. Of the HIV+ children 56% were initiated late/defaulted/not on ART. The least common factors were TB infection (16%, n=33) and herbal intoxication (8%, n=17).

Conclusions: Diarrhoea still plays a significant role in child morbidity and mortality with most deaths related to sepsis, pneumonia or diarrhoea. Poor infant feeding which is also linked to diarrhoea is another main factor contributing to SAM and death in children < 2 years old.

65. Malnutrition in the institutionalised elderly: a cross sectional survey using the Mini Nutritional Assessment (MNA) screening tool

Liska Robb, Corinna May Walsh, Riette Nel, Annica Nel, Hester Odendaal, Reon van Aardt

Introduction: When malnutrition is prevalent in the elderly, morbidity and mortality rates are likely to increase.

Aim: The aim of this study was to determine and compare the nutritional status of the elderly in two retirement villages - one situated in a higher socio-economic area and one in a lower socio-economic area.

Methods: Sixty-two elderly retirement village residents from both types of socio-economic areas were included in this cross-sectional study in Bloemfontein, Free State. The nutritional status of participants was assessed using the Mini Nutritional Assessment (MNA®) tool. Indicators of nutritional status that were assessed included socio-demography, global assessment, dietary assessment, and subjective assessment.

Results: Malnutrition was identified in 3.2% of participants from the retirement village situated in the higher socio-economic area and in 11.3% of participants from the lower socio-economic area - a difference that was not statistically significant [95% CI: -18.6%; 1.6%]. A significantly higher percentage of participants from the lower socio-economic area were found to be at risk of malnutrition than those from the higher socio-economic area [95% CI: 19.8%; 51.4%]. Similarly, significantly more participants from the higher socio-economic area were classified as well-nourished compared to those from the lower socio-economic area [95% CI: 28.7%; 58.3%].

Conclusion: Elderly participants from the lower socio-economic area were more likely to have a poor nutritional status and be at risk of malnutrition. The findings highlight the need to focus on prevention of malnutrition in order to promote health and prevent the development of co-morbidities in the elderly.

66. Food consumption patterns and lifestyle of students at University of Zululand

Mosa Selepe, Nokuthula Shongwe

Introduction: University years are a period where students increasingly make independent choices about their food consumption patterns and lifestyle. Food choices can differ because of childhood food consumption patterns, gender and the living arrangements. While good eating habits are an essential part of healthy lifestyle, poor nutritional habits are established risk factors for chronic diseases. The aim of the study was to assess food consumption patterns and lifestyle behaviour of university students at the University of Zululand.

Methods: Non experimental purposive sampling, quantitative approach was used in an interview schedule among 120 students by means of questionnaires. The questionnaire has three sections namely biographic profile, dietary and lifestyle practices of students. Data was analysed using Microsoft Excel and Statistic Package for Social Sciences (SPSS).

Results: More than 50% of the students choose the convenient foods and they were not physically active so that they can maintain their study time. The research showed that less than half of student didn't eat indigenous or traditional foods but they consume lot of junk food due to accessibility. Most students also indicated that they sometimes skip meals during the day which results in unhealthy eating habits. They also reported that they eat what is available to them at that moment.

Conclusion: The lifestyle of students at the university is not good because most of them are not involved in any physical activities and they don't eat healthy. This can contribute to them having chronic diseases which can have bad effect on their health.

Keywords: consumption patterns, lifestyle behaviour, food choices, physical activity, chronic diseases

67. A guide for healthy meal provisioning in the workplace

Pontsho Sepoloane

Introduction: The prevalence of obesity is on the incline and it is imperative that all sectors work together to create an enabling environment. Currently employees access unhealthy meals from work site canteens, during meetings and vending machines. During the 60th World Health Assembly a global plan of action on Worker's health 2008-2007 was endorsed which urges member states to advocate for healthy diets and physical activity amongst workers. It is against this backdrop, a guide for healthy meal provisioning was developed in 2015, aiming to provide guidance on healthy meal provisioning and influence the food environment in the workplace.

Method: The guide was developed in consultation with stakeholders from provinces, government departments and professional associations. The process of consultation and development happened over a period of 11 months.

Results: Once the guide was finalised, sensitisation workshops were conducted for 26 National government Departments and four parastals. Subsequently, the National Department of Health reviewed their catering policy in line with the guide for healthy meal provisioning, which has shown changes in the type and portions of food and beverages available such as replacement of fizzy drinks with water.

Conclusion: It is envisaged that the guide for healthy meal provisioning in the workplace will influence the food environment in workplace setting. To institutionalise the guide, workplace catering policies should include principles for healthy meal provisioning.

68. Breast milk intake, fat and energy content: A 4-day test-weighing study in exclusively breastfed infants

Sicelosethu S. Siro, Linda P. Siziba, Susanne Dold, Maria Andersson, Lize Havemann-Nel, Jeannine Baumgartner

Introduction: Exclusive breastfeeding (EBF) in the first six months of life is recommended. There is, however, very limited information on the breast milk intake of EBF infants, as well as on the energy and fat content of breast milk in South Africa.

Aim: To assess breast milk intakes and fat and energy content of breast milk in a convenience sample of EBF infants and their mothers from a semi-urban township in South Africa.

Methodology: Twenty-four apparently healthy mothers and their EBF 2- to 5-month-old infants stayed in the metabolic ward of the North-West University for four days. Infants were weighed (±1g accuracy) before and after each feed to determine breast milk intake. A foremilk sample was collected to determine fat and energy content of milk using the creamatocrit method. An additional mid-feed and hind-milk sample was collected from the first feed per day.

Results: Mean breast milk intake was 369±98g per day. Mean daily energy and fat intake were 158±48KJ/kg and 1.57±0.49g/kg body weight respectively. Mean fat and energy concentrations of fore-milk were 25.7±7.3g/L and 2545±256KJ/L, respectively. Analysis of within feed variations (using one feed) showed mean fat concentrations of fore- (26.8±8.2g/L), mid- (37.6±7.0g/L) and hind-feed (50.2±10.4g/L) milk differed significantly ($P < 0.001$). Mean energy concentrations of fore- (2523±323KJ/L), mid- (2947±275KJ/L) and hind-feed (3464±410KJ/L) differed significantly ($P < 0.001$).

Conclusion: These data suggests the likelihood of energy deficiency among EBF infants in the Potchefstroom area. Further studies are needed to confirm these findings in a larger sample and with more accurate methods.

69. Malaria,Hemoglobin and Nutritional Status of Under-five Children in Abeokuta South Local Government Area, Ogun State

Abimbola Sobo, Catherine Oladoyinbo

Background and Objective: Anemia is a serious public health issue especially in malaria endemic areas. Therefore this study aimed at assessing the prevalence of malaria, haemoglobin status and nutritional status of under-five children in Abeokuta South Local Government area.

Methods: Multi –stage sampling technique was employed in selecting three communities for the study. From the fifteen (15) wards in the Abeokuta South Local Government Area three (3) wards were randomly selected and one (1) community from each ward. From the household list, 400 households with an under-five child were randomly selected. A structured interviewer's questionnaire was administered. Anthropometric measurements were taken using standard equipment. Rapid diagnostic Test Kit), Care Star Malaria HRP2 (Pf) (Access bio, Inc.) was used for identification of malaria parasite. Finger pricked blood samples was collected for haemoglobin test.

Results: About 49% of the children were males while 51% were females. More than half (62%) of the mothers earn less than ₦30,000 per month. About 6% had no formal education, 34% completed secondary school and less than 1% had higher degree. The prevalence of malaria is 21.6%, anaemia is 61%, stunting is 23%, underweight is 10% and wasting is 6% among the children. There is a significant relationship between malaria and anaemia ($P=0.042$). There was however no significant relationship between nutritional status and malaria infection among the children

Conclusion: Malaria is a risk factor for anaemia among this group.

Keywords: Malaria, Anthropometric Indices, Under-five children, Rapid Diagnostic Kit, Haemoglobin

70. 25-hydroxyvitamin D and parathyroid hormone: Association with Metabolic syndrome in black South African women

Olusola Funmilayo Sotunde, Herculina Salome Kruger, Hattie Wright, Lize Havemann-Nel, Carina MC Mels, Chrisna Ravyse, Marlen Pieters

Introduction: The relationship between 25 hydroxyvitamin D (25(OH)D), parathyroid hormone (PTH) and metabolic traits appear to differ among ethnicities and may be influenced by excess adiposity.

Aim: To examine the association of serum 25(OH)D and PTH, respectively, with the metabolic syndrome (MetS) while controlling for adiposity in black women.

Methods: A cross-sectional study was carried out among 209 urban black women aged ≥ 43 years from the North West Province, South Africa. The relationship between 25(OH)D, PTH and body composition were explored using multiple regression models. To explore the association between 25(OH)D, PTH and MetS, a separate variable was created including at least three of the MetS criteria, but excluding elevated waist circumference as a diagnostic criterion in a logistic regression model.

Results: Majority (69.9%) of the women were overweight or obese and 65.5% had excessive adiposity using the age specific cut-off points for body fat percentage. BMI and waist circumference, but not body fat % had negative associations with 25(OH)D, while all body composition variables were positively associated with PTH, also after adjusting for confounders. Before and after adjusting for age, body fat, habitual physical activity, tobacco use, season of data collection and estimated glomerular filtration rate, neither 25(OH)D nor PTH showed significant associations with the MetS.

Conclusions: Although 25(OH)D was negatively and PTH was positively associated with adiposity variables in black women, there was no association between either 25(OH)D or PTH and the MetS in this study population, nor did adiposity influence these relationships.

Key words: 25(OH)D; PTH; adiposity; obesity; metabolic syndrome; black South African women

71. Child Support Grants are not protective of nutritional status in children in an underprivilege area in Nelson Mandela Bay health district, Ibhayi

Liana Steenkamp, Shawn McLaren, Danie Venter

Introduction: Ibhayi is the most population dense area in Nelson Mandela Bay municipality and households are reliant on social grants. Child support grants (CSGs) are intended to target the most vulnerable households. Research from 2013 showed that CSGs may not guarantee food security in underprivileged communities in the Eastern Cape.

Aim: To describe the nutritional status of children below 24 months of age in the context of CSGs in Motherwell, Ibhayi.

Methods: A convenience sample (n=419) of children below 24 months of age, was selected from 20 clusters of clinics and creches in Motherwell, Ibhayi from October 2015 to February 2016 (Ethics approval: H15-HEA-DIET-002). Informed written consent was provided before trained, fieldworkers did anthropometric measurements and completed a questionnaire. For the purpose of this bivariate analysis socio-economic variables and nutritional status were included.

Results: CSG data was available for 327 children with valid z-scores. From the sample 67% (n=221) received CSGs. CSG holders had a significantly (p=0.026) lower height-for-age z-score (-0.38; SD=1.27) compared with non-grantholders (-0.03; SD=1.47). Although weight-for-age and weight-for-length z-scores were also lower in the CSG group versus the non-grantholder group, no significant differences could be demonstrated.

Conclusion: CSGs during the first 1000 days does not seem to be protective in terms of nutritional status. Health care professionals should provide specific nutrition messages to caretakers and CSG recipients to alert them to the fact that this grant should be utilised for replacement and/or complementary feeding to prevent malnutrition in the first 1000 days.

72. Sodium content of some selected foodstuffs included in Regulation 214

Bianca Swanepoel, Herman Myburg, Linda Malan, Edelweiss Wenzel-Viljoen

Introduction: South Africans are consuming salt in excess which contributes to the high prevalence of hypertension in the country. As part of the strategy of the Department of Health to decrease the salt intake of the population to less than 5g per day the sodium content of 13 categories of foodstuffs are regulated (R214). The first target of the regulation comes into effect in June 2016.

Aim: To determine the current sodium content of these foodstuffs and if the sodium content as indicated on the label is accurate.

Methods: The sodium content of ten food products in each category was measured using flame atomic absorption spectroscopy (AAS). Samples were microwave digested before analyses. The mean sodium content (mg/100g), standard deviation (±SD) and percentage of products below the target were calculated for each food item.

Results: Preliminary results of three of the food categories showed that 61.1% already meet the 2016 target of R214. The mean sodium content of soup powders, gravy/sauces and stock cubes/jellies were 5078.67mg/100g (±0.16), 4315.28mg/100g (±0.17) and 5240.53mg/100g (±0.30), respectively. The sodium content of 33.3% of the food products stated on the label of the food product was accurate within a 10% range.

Conclusion: This data shows that some of the food products are complying with the sodium content targets of June 2016. There are still some food products that are not compliant, and should be carefully monitored. The accuracy of the sodium content on the label should also be checked regularly.

Keywords: Salt; sodium; regulation; hypertension

73. Impact and behaviour change resulting from nutrition leadership development in South Africa

Christine Taljaard, Bianca Swanepoel, Johann Carl Jerling, Bianca Swanepoel

Introduction: Nutrition has been placed at the heart of the global agenda when the United Nations adopted the resolution "Decade of Action on Nutrition". Generating a critical mass of leaders at all levels within countries will play a vital role in achieving nutrition related outcomes from community to international levels.

Methods: South African ANLP alumni (2002 – 2015) that have participated in a similar leadership programme have been invited to answer the question: "What behavior did you change based on your experience at the ANLP and was the impact in your professional environment". Twenty one responses were received and summarized under two major themes, behavior change and personal or work related impact.

Results: The majority (90%) of the participants reported that following leadership training a positive behaviour change was adopted, and that this behaviour change translated into a specific work or personal related impact. Behaviour changes included practising reflection, adopting an internal locus of control, improving communication skills and active participation in other leadership development experience. Reported impacts included participants making a positive career change, building and utilizing of networks, improved understanding of the value of diversity and improved international collaborations.

Conclusion: Nutrition professionals report a change in both behaviour and work related impact as a direct consequence of leadership capacity development. Developing the ability to lead is critically important in the continued professional development of nutrition professionals if South Africa is to successfully address its ongoing nutrition challenges.

74. Nutritional status of the elderly in Maseru, Lesotho

Rose Kokui Dufe Turkson, Corinna May Walsh, Riette Nel

Introduction: The world is currently experiencing an upsurge in the number of older people due to a decrease in fertility and increase in life expectancy. In developing countries, the elderly often carry the additional burden of raising grandchildren while caring for themselves and contributing to society. Their ability to function independently is, however, affected by disability, malnutrition and frailty.

Aim: The aim of the study was to assess the nutritional status of the elderly in Lesotho.

Methods: A cross-sectional quantitative study was carried out in 300 elderly

participants aged 65 years and above and living freely in their communities in the Maseru Urban district. The Mini-Nutritional Assessment (MNA) was completed in a structured interview with each participant. The MNA was scored as < 17points = malnourished, 17-23.5 = at risk of malnutrition, > 23.5 =well nourished.

Results: 71% (N=213) of participants were female. Median age was 73.6 years with the oldest being 95 years. Most, 65.9% (N=197) had primary education with only 6.4% (N=19) having tertiary education. 44.6% (N=134) were receiving pension or state grants. The median MNA score was 20.5 (ranging from 9 to 28). The majority of participants were at risk of malnutrition 66% (N=198), while 19.3% (58) were undernourished and 14.7% (N=44) well nourished.

Conclusion: A high percentage of participants were malnourished or at risk of malnutrition. Culturally acceptable ways of preventing and addressing malnutrition are essential to improve quality of life and ensure that the elderly can live independently for as long as possible.

Key Words: elderly, nutritional status, malnutrition

75. Review of a multi-sectoral approach that contributed to 11% reduction in Severe Acute Malnutrition Case Fatality Rate in children under 5 in Nkandla subdistrict, Kwa-Zulu Natal

Tanya van Aswegen

Introduction: Malnutrition is a complex disease with multi-faceted causes. uThungulu District has been affected by a high Severe Acute Malnutrition (SAM) Case Fatality Rate (CFR) linked to factors outside the scope of the Department of Health. The objective of this review was to assess if multi-sectoral support can influence a reduction in SAM CFR.

Materials and Methods: Baseline SAM CFR was obtained by doing a cross-sectional review of District Health Information System Data. Household screening was done using a standardised profiling tool and standard operating procedure to identify children under 5 that were at risk of malnutrition. An Electronic database using Microsoft Excel was created to capture the information of all the children profiled in the subdistrict.

Results: 4728 households were profiled. 27 children were identified at various stages of acute malnutrition or at risk of becoming malnourished. Through multi-sectoral support the possible underlying causes of malnutrition was addressed. SASSA assisted 73 families with Poverty Alleviation Packages and 39 Children with temporary Child Support Grants. Department of Home Affairs is assisting 108 children with Birth Certificates and The Department of Social Development assisted 36 families with Social Relief of Distress packages. During the profiling period (August 2015 – January 2016) there was a 3% SAM CFR compared to 14.3% in the previous year in the same period (August 2014 – January 2015) when no profiling was done.

Conclusions: A multi-sectoral approach to the management of malnutrition could significantly reduce the SAM case fatality rate. Keywords: Multi-sectoral, Severe Acute Malnutrition, KZN.

76. Agreement between measured height, and height predicted from ulna length, in adult patients in three South African hospitals

Louise van den Berg, Corinna Walsh

Objective: To assess the agreement between measured height, and height predicted from ulna length using the Malnutrition Universal Screening Tool (MUST) equations, in adult patients admitted to government hospitals in Bloemfontein, South Africa.

Design: Descriptive cross-sectional survey.

Setting: Medical, surgical, pulmonary, orthopaedic, cardiovascular and general wards at Pelonomi, Universitas and National Hospitals in Bloemfontein.

Subjects: All patients 19-60 years, admitted during two weeks in March 2015 who gave informed consent and were able to stand unassisted.

Outcome measures: Height, weight and ulna length were measured. Predicted height and body mass index (BMI) were calculated from ulna length using MUST equations, and compared to actual standing height and BMI by 95% confidence intervals (CI) and Bland Altman analysis.

Results: The sample comprised 200 participants (48% female; median age: 42 years). The median height estimated from ulna length (170.2 cm; range: 154.2 to 213.0 cm) was statistically significantly (95% CI [7.1; 7.7]) longer than the median actual standing height (163.9 cm; range: 145.1 to 188.4 cm). The Bland Altman analysis indicated that the 95% limits of agreement between the two methods ranged from -19.8 to 5.7 cm. Median BMI based on estimated height (20.1 kg/m2) was statistically significantly (95% CI [-1.9;-1.6]) lower than median BMI calculated from standing height (21.8 kg/m2).

Conclusion: Height predicted from ulna length with the MUST-equations, overestimated height in this population. This may be related to high prevalence of stunting in the South African population. The discrepancy may have clinical implications particularly for critically ill patients.

77. Consumption of locally produced foods in South Africa - A qualitative inquiry of women's perceptions

Marinka van der Hoeven, Tina Koch, Irmgard Jordan, Eleonore Heil, Nicole Claasen

Consumers' perceptions towards locally produced foods (LPFs) determine food choices. Strengthening local food systems may contribute to local economic growth, providing employment opportunities, and improve access to healthy food and more food diversity.

This qualitative study is part of a larger project exploring the potential of local food systems for sustainable development. Twelve women with a middle-high income (R150,000–R600,000 per annum), living in a rural area were interviewed to describe how the consumption of LPFs has changed over time. The applied content analysis used codes identified in an inductive and deductive process.

Women reported to consume a variety of LPFs, such as pumpkin, tomato, oranges, milk, beef, and peanuts. Preference towards LPFs was related to lower prices, freshness, taste, and support of local producers and businesses. A perceived increase of consumption over time was linked to reasons such as more home gardening, a larger variety of LPFs, and health benefits. A perceived decline in consumption was attributed to reasons such as seasonable availability and accessibility of LPFs (including decreased knowledge where and from whom to buy LPFs), convenience regarding food purchase and preparation, availability of processed foods, time constraints,

lacking preparation skills, and awareness of LPFs quality.

Synergies between agriculture and nutrition policy development are required to improve accessibility of LPFs and promote their benefits regarding health and local economies. Awareness campaigns and food and nutrition education will be crucial to make LPFs more attractive for consumers and local food systems more profitable for producers and distributors.

78. Adapting FAO/INFOODS guidelines into a customised checklist for Quality assurance of Baby food composition data prior to publication

Averalda E van Graan, Joelaine M Chetty, Malory R Links

Achieving reliable quality food composition data is important. The FAO/INFOODS have established guidelines for checking Food Composition Data prior to publication to ensure reliable data. These guidelines were used to compile a customised checklist for quality assurance of baby foods data prior to publication.

A customised checklist was compiled for quality checks to apply to the Baby foods group. The 2-page document consisted of checks on moisture, approximates, energy, total fat, carbohydrates, ash and vitamins. Sub checks included: sums of fatty acids (FA), SFAs, and PUFAs, total carbohydrate, sum of starch, total sugars and dietary fiber. Ash checks included calculations of sum of minerals. Conversion calculations for Vitamins A, E, and folate concluded the checklist.

A total of 348 food items were subjected to the check list. The first quality check shown 13% products falling outside the acceptable proximate ranges, while 23% of products did not adhere to energy references. Seven items did not conform to the sum of FA check, while checks for sums of FSA, MUFAs and PUFAs could not be done due to missing data. Three items did not adhere to carbohydrate checks. Only one food item did not conform to the ash quality check while vitamin A and E checks were omitted due to missing data. Folate checks shown 2 items falling outside guideline references.

The FAO guidelines is an important guideline to use in developing an individualised checklist for data compilers. The current customised checklist proved to be a vital tool to improve data quality.

79. Gene-diet interactions in relation to homocysteine

Jacomina P van Schalkwyk, Edelweiss Wentzel-Viljoen, Cornelie Nienaber-Rousseau

Introduction: Elevated homocysteine (Hcy) is associated with several pathologies. Understanding gene-diet interactions related to Hcy can lead to tailored dietary advice.

Aim: To investigate interactions between diet and single nucleotide polymorphisms (SNPs) in relation to Hcy concentrations.

Methods: Five SNPs of Hcy-metabolising enzymes were analysed in 2010 black South Africans of the Prospective Urban and Rural Epidemiology (PURE) study.

Results: With increasing numbers of the minor allele in the MTHFRC677T genotypes, Hcy increased ($p < 0.00001$). Hcy decreased from the homozygous MTR2756AA carriers to the heterozygotes, but heterozygotes did not differ from those harbouring the homozygous minor allele ($p < 0.01$). Interactions were observed for CBST833C/CBS844ins68*biotin ($p=0.04$) and MTHFRC677T*vitamin B12 ($p=0.001$). In carriers of the CBST833C/CBS844ins68 major allele, elevated biotin intake was associated with decreased Hcy, whereas in the homozygous minor allele Hcy increased. For major allele carriers of MTHFRC677T, Hcy decreased while the TT genotype's Hcy increased as vitamin B12 intake increased.

With decreasing total fat, PUFA, and SFA intake in MTHFRC677T minor allele carriers, a more pronounced decrease in Hcy was observed than for CC homozygotes ($p=0.01$; $p=0.004$; $p=0.04$). In CBSG9276A the minor allele carriers presented with a decrease in Hcy with decreasing diet quality, whereas in GG homozygotes' Hcy increased ($p=0.04$). The homozygous minor allele of CBST833C/CBS844ins68 and the homozygous major allele of CBSG9276A showed increased Hcy with elevated protein intake while the other genotypes had decreased Hcy ($p < 0.001$; $p=0.01$, respectively).

Conclusion: The effect of the SNPs on Hcy are modulated by diet and can be used to treat hyperhomocysteinaemia.

80. A balanced basic food basket approach to monitor food affordability in South Africa

Hester Vermeulen, Hettie Schonfeldt, Beulah Pretorius

Introduction: Food affordability has a critical impact on households' food choices and related aspects such as food security. 'Food poverty' arises when the amount spent on food by a household is inadequate to purchase a particular low-cost food plan. The main objective of the research reported in this paper is to compile a scientifically sound 'balanced food basket' for low-income consumers in South Africa, in order to facilitate the measurement of food affordability in South Africa.

Methods: Firstly a review of literature was done (scientific literature and government / organisations' websites, etc.) on approaches applied in South Africa to monitor food affordability. Secondly two healthy food baskets were compiled in order to measure and compare the affordability of basic healthy eating that take into consideration nutritional recommendations of the Department of Health including all the food groups, as well as typical food purchasing patterns extracted from StatsSA Income and Expenditure Survey 2010/11. Basket 'A' is a more economic basket with proportionally more staple food units, while Basket 'B' has more dietary diversity. The costs of the food baskets were calculated by applying the official food prices monitored by Statistics South Africa.

Results: In February 2016 the monthly basket costs for a family of four amounted to R3165 (Basket 'A') and R3950 (Basket 'B'), indicating a significant 'premium' of about 25% toward attaining a more dietary diverse basket. Furthermore it is shown that at least 25% of people in South Africa cannot even afford Basket 'A'. Time series trends comparing the Consumer Price Index for food versus these baskets are also compared and discussed.

81. The Nutrient Rich Food index as tool to identify healthy snacks

Marina Visser, Tertia van Zyl, Mieke Faber

Introduction: The Nutrient Rich Food (NRF) index is a nutrient profiling system that assigns a score to individual foods reflecting their nutrient quality based on nutrient density.

To evaluate the nutrient quality of snacks by calculation of an NRF14.3 score.

Method: An NRF14.3 score based on 14 nutrients to encourage, three nutrients to limit and energy density was calculated for 120 foods and

beverages. Calculations were done for three age groups: 4-9 years, 9-18 years and > 18 years, using appropriate Dietary Reference Intakes.

Results: NRF14.3 scores were inversely related to energy density, indicating that energy dense foods are less nutrient dense. Vegetables and fruits, followed by low-fat milk products, lean meats, fish and eggs had the highest NRF scores. Breakfast cereals, cheese, dried fruits and nuts had lower scores due to added sugars, high fat, sodium and high energy density. Nuts had relatively good nutrient content, but high energy density. Cakes, biscuits, potato crisps, chocolates, ice cream, sweets, pies, and sweetened beverages had a higher energy density and lower nutrient content compare to all other foods.

Conclusion: Snack foods high in nutrients and low in energy were identified using NRF scores. Based on these scores, individuals should be encouraged to snack on vegetables, fruits, low-fat milk products, lean meats, fish and eggs. This is in line with food based dietary guidelines which suggest that more vegetables, fruits, lean meats, milk products and less fats, sugars and salt should be eaten.

Keywords: Nutrient profiling, Nutrient Rich Food index, Snack foods

82. Knowledge and practice of food safety among pregnant women in Ijebu- ode local Government Area of Ogun State, Nigeria

Nimot Opeyemi Wahab, Abisola Rachael Akano

Introduction: Since feotus are nourished directly by the mother during pregnancy, knowledge and practice of food safety becomes important during this dynamic period of change. Descriptive survey using multistage technique was adopted to select four hundred and four (404) pregnant women who attended antenatal clinic at the time of investigation in both Government and private hospitals in the study area. A validated semi structured Food Safety Knowledge and Practice Questionnaire (FSKPQ) was used to gather demographic and other information relating to the study. Knowledge and practice scale 0f 0-15 was adopted and categorized as high:≥ 10, average : 6.6-9.9 and poor: 0-6.5. Data were analysed using descriptive statistics and t test at p=0.05.

Results: Most of the respondents also attended Government owned hospitals (71.2%). Respondents possessed poor knowledge on the followings: Common food infections among pregnant women (4.86±0.76), orientation on the principles of safe food handling during pregnancy(3.26±0.54) and safe cooking temperature and time (5.72± 0.98). Consumption of food and drinks that are dangerous during pregnancy was average (6.95), average standard hand washing procedure (8.24±0.76), poor kitchen practices that can cause cross contamination (5.42±0.78) and poor general cleaning and sanitizing of the cooking and feeding area (5.82±0.82). A significant difference between knowledge and practice of food safety among pregnant women was established (df =52 ;t=63.73 ;p < 0.05).

Conclusion: Food safety knowledge and practice was poor among pregnant women. Training should be organized among pregnant women.

83. Impact of an ISO 22000 system on patient satisfaction levels and food safety audits results

Rachael Warren

Introduction: The ISO 22000 food safety system focuses on quality, customer satisfaction and food safety.

Aim: To determine: patient satisfaction with the food and food service; the relationship between patient demographics and satisfaction; and the impact of ISO 22000 on patient satisfaction and food safety audit results.

Method: This cross sectional study among patients in a private hospital comprised interviews using a questionnaire over one year during the implementation of an ISO 22000 food safety system. The results of food safety audits were analysed to determine any improvements in scores after ISO 22000 implementation.

Results: 160 patients (M=25.6%, F=74.4%) aged between 13 and 89 were interviewed. The average hospital stay was 3-7 days; most patients had not been on a special diet. No statistically significant relationships were found between demographics and patient satisfaction. A statistically significant increase in satisfaction was found for the overall catering service (p=0.014), a marginally significant increase was found for the food temperature (p=0.087) after ISO 22000 implementation. The hygiene and microbiological scores of food safety audits improved by 15% and 45% respectively after ISO 22000 implementation. Despite the lack of statistically significant improvements in some areas of patient satisfaction, the improvements that were found and the improvement in food safety audit results indicate that ISO 22000 offers many advantages in a hospital foodservice department.

Conclusion: ISO 22000 implementation shows promise to increase patient satisfaction levels and improve the results of food safety audits.

Keywords: Patient satisfaction, food safety audits, private hospital foodservice department, ISO 22000

84. South African Nutrition Professionals' Attitudes and Perceived Norms and Behavioural Control Related to Dairy Consumption

Friede Wenhold, Zelda White

Background: Intakes of dairy-related nutrients of South Africans are low. Nutrition professionals influence dietary behaviour. Their own disposition related to dairy is unknown, yet important in promoting the South African "Have milk, maas or yoghurt every day" food-based dietary guideline.

Aim: Guided by the Theory of Planned Behaviour (TPB), this study aimed to describe attitudinal, subjective norm and behavioural control factors of nutrition professionals related to a target behaviour of 2-3 servings of dairy daily.

Methods: An electronic survey (Qualtrics Online Survey Software) of conveniently sampled ADSA and NSSA members determined dairy-related behaviour, intentions, attitudes, perceived subjective norms and behavioural control regarding dairy in general, and of milk, maas, yoghurt and cheese.

Results: 306 responses (age 36.6±10.5 years) were received. A third of nutrition professionals reported that 4-6 times per week their daily dairy intake was 2-3 servings, yet over 40% met the target once per week or less often. Intake differed across products. Intention to consume the target was high (5.2±0.12; scale 1-7). Attitudinal evaluations revealed highest belief scores related to nutritional quality and association with bone health. Links with cancer development, diabetes and the environment were believed to be least likely. Professional training and scientific evidence emerged as strongest subjective norms. Nutrition professionals perceived themselves to be in control of the target behaviour, yet their clients significantly less so (P < 0.0001). The TPB explained 53% of variance in dairy intake.

Conclusions: TPB is useful in explaining and predicting dairy-related behaviour among nutrition professionals. Findings can aid customised nutrition promotion.

85. Evaluation of a mass-media public awareness campaign to reduce discretionary salt use in SA

Edelweiss Wentzel-Viljoen, Krisela Steyn, Carl Lombard, Anniza De Villiers, Karen Charlton, Sabine Frielinghaus, Christelle Crickmore, Vash Mungal-Singh

Introduction: The SA strategic plan to reduce CVD includes the target to reduce the population salt intake to less than 5 grams/day. Currently salt intake is too high with about 40% coming from discretionary salt.

Aim: To assess the impact of a public awareness campaign on the knowledge, attitudes, beliefs and intended behaviours of the target audience.

Methods: A mass-media campaign, using television, radio advertisement and other platforms for information dissemination was undertaken to increase public awareness related to the association between high salt intake, blood pressure and CVD. Community based surveys before and after the campaign were conducted in a cohort of black women, aged 18-55 years in three provinces. Questions included knowledge, attitudes and beliefs regarding salt use. Interest in engaging with salt reduction behaviours was assessed using the 'stage of change' model. Multinomial regression models were used for comparison.

Results: 550 women participated at baseline and 477 in the follow-up survey. Most of the indicators of knowledge, attitudes and behaviour change show a significant move towards considering and initiating reduced salt consumption. Post intervention, significantly more participants reported that they were taking steps to control salt intake (38% increased to 59.5%, $p < 0.0001$). There were positive trends (21% increased to 43%, $p < 0.0001$) in the 'stages of change' categories towards reducing salt intake.

Conclusions: We demonstrated the success of a public health campaign to raise awareness on discretionary salt use. The findings strongly suggest that mass-media campaigns are important in strategies to reduce the discretionary consumption of salt.

86. Comparing food classification of various nutrient profiling models to the opinions of South African dietitians

Mariaan Wicks, Edelweiss Wentzel-Viljoen

Introduction: Nutrient profiling (NP) is defined as the science of ranking foods according to their nutritional composition for the purpose of preventing disease and promoting health. Internationally, NP has recently proliferated as numerous NP models are now being used to support various food and nutrition policies aimed at assisting the public in making healthier food choices. The aim of this study was to assess and compare the validity of five NP models, used or proposed to be used for food labeling and advertising regulations, with the standard ranking of 120 foods by dietitians.

Method: Registered dietitians in South Africa were requested to categorize 120 foods into one of six positions on the basis of their healthiness via an online survey. These categorizations were used to produce a standard ranking of the 120 foods. The standard ranking was compared with the results of applying the five included NP models to the 120 foods. The Spearman's p rank correlation test was used to compare the average scores awarded to the 120 foods by the dietitians with the NP models.

Results: A total of 85 dietitians participated in the study. All of the included NP models showed good correlation with the standard ranking (Spearman's p correlation = 0.419-0.717). The SA NP model showed the strongest correlation with the standard ranking of foods.

Conclusion: The results suggest that the South African NP model, used to regulate nutrient and/or health claims, rank and categorize foods in accordance with the views of South African dietitians.

87. The nutritional quality and labelling of ready-to-eat breakfast cereals sold in South Africa

Nicky Wiles

Introduction: Ready-to-eat breakfast cereals (RTEBC) make an important contribution to the nutritional intake of children. However, researchers have found significant differences between the nutritional quality of children versus non-children's RTEBC. South Africa has strict legislation regarding the use of nutrition claims to promote products. To date, no research has been published surrounding the nutrition information on South African RTEBC.

Methods: This study examined the packages of RTEBC to compare both the nutrient content per 100g and recommended serving size; and determine the accuracy of any nutrition claims. One hundred and thirty four RTEBC were purchased from three major supermarkets and categorised into children's cereal and six types of non-children's cereal.

Results: Children's cereals formed 21% (n=28) of the sample. They were significantly more likely to have sugar as the first or second ingredient listed ($p < 0.0005$). Per 100g, children's cereals contained significantly more carbohydrates ($p < 0.0005$), sugar ($p < 0.0005$) and sodium ($p=0.006$) than non-children's cereal collectively. Per 100g and per serving non-children's cereal was significantly higher in protein, fat and dietary fibre ($p < 0.05$) compared to children's cereal. Seventy-seven percent of all RTEBC (n=103) had a nutrient content claim and 3% (n=4) had a comparative claim. The most common claim was regarding dietary fibre (69 claims) followed by vitamins and minerals (65 claims). Eight nutrient content claims were not compliant with legislation.

Conclusion: Overall, significant differences in nutritional quality exist between South African children's and non-children's RTEBC. Food manufacturers need to be more vigilant regarding nutrient claims and adhere to the labelling legislation.

88. Dietary adherence amongst adults with type 2 diabetes mellitus: A South African urban population perspective

Tammy Winskill, Salome Kruger, Renee Blaauw

Introduction: Although it is possible to manage Type 2 diabetes mellitus (T2DM) effectively and prevent/delay the onset of micro- and macro-vascular complications and improve outcomes, non-adherence to behaviour recommendations escalates the progression of disease and increases the requirements for pharmaceutical interventions at an added cost to the health industry. The association between dietary adherence and glucose control was assessed, and factors that influence non-adherence to dietary recommendations were identified.

Methods: Ninety-one patients with T2DM attending two private diabetes

clinics in Gauteng participated in a structured questionnaire. Of these participants, 37 also participated in the focus group discussions (FGDs). The questionnaire determined socio-demographics and biochemical data. Additionally, participants were scored according to their intake of recommended diabetes food which was used to quantify dietary adherence. The FGDs were used to understand the barriers and motivators to adhering to dietary recommendations.

Results: Non-adherence to dietary recommendations was high (77%) with no significant associations between dietary adherence and the various variables. Glucose control was suboptimal (68% > 7% HbA1c). Challenges to adherence included difficulty in breaking habits and resisting temptation, eating out, and too much food restriction. Motivators to adherence included the desire to attain and maintain good health and prevent the disease worsening, seeing positive results, having support, and making a healthy lifestyle habitual.

Conclusion: Understanding factors that motivate and challenge patients to make changes will help health professionals design interventions that are sustainably adhered to.

Keywords: type 2 diabetes, dietary non-adherence, glucose control, motivators to adherence, challenges in non-adherence

89. Estimated Burden of Anthropometric Failure Among Malawian Children

Mzondi Ziba, Alexander Kalimbira, Zione Kalumikiza

Introduction: The prevalence and trends of under-nutrition among children below the age of 5 in Malawi are well-known from a conventional (stunting, wasting and underweight), but not aggregate perspective. However, conventional indices are thought to underestimate the true burden of under-nutrition, because they overlap.

Aim: To estimate the burden of under-nutrition among Malawian children below the age of 5, using the Composite Index of Anthropometric Failure (CIAF), which enables determination of an overall burden of malnutrition.

Methodology: CIAF was applied on four data sets from the Malawi Demographic and Health Surveys (MDHS) of 1992 (n=3,174), 2000 (n=10,102), 2004 (n=8,934) and 2010 (n=4,586) to generate anthropometric failure values.

Results: Up until the 2010 MDHS, which registered a 51% prevalence of anthropometric failure, the prevalence approximated 59% in 1992, and 57% in both 2000 and 2004. These values are much higher than the prevalence of underweight (< 24%), a conventional index currently used as proxy aggregate measure of under-nutrition in many countries.

Conclusions: Compared to CIAF, conventional anthropometric indices seriously underestimated the prevalence of anthropometric failure among Malawian children below the age of 5. This is due to the fact that CIAF gives an aggregate estimate of anthropometric failure, hence it is a better indicator of the magnitude of under-nutrition. Therefore CIAF should be integrated in routine nutrition assessments and cut-off values to assess the degree of its severity should be developed, to make it even more relevant.

Key words: Composite, Anthropometric failure, Prevalence

1. In vitro effect of crude leaf extracts of Moringa oleifera Lamarck on the formation of advanced glycation end products

Seye Adeniran

Introduction: Leaf extracts of Moringa oleifera (M. oleifera), have shown to lower blood glucose levels in both human and animal models of type 2 diabetes, however, the anti-glycation properties of these extracts have not been investigated.

Objectives: To investigate the inhibitory effects of these extracts on the formation of advanced glycation end products (AGEs) in vitro and compare these effects with the inhibitory effect of aminoguanidine.

Methods: Bovine serum albumin was incubated with glucose in the presence of hexane, ethyl acetate, methanol and aqueous leaf extracts of M. oleifera at 370C for 20 and 40 days. Total immunogenic AGEs, carboxymethyllysine (CML) and fluorescent AGEs formed were measured by means of ELISA and spectrofluorometry and anti-glycation activity of the extract was expressed as percentage inhibitory activity.

% Inhibitory activity = (([AGEs]_(absence of plant extract) –[AGEs]_(presence of plant extract))/[AGEs]_(absence of plant extract)) x 100

Results: At 20 days, all leaf extracts of M. oleifera demonstrated higher inhibitory activity than aminoguanidine against formation of total immunogenic AGEs but less at 40 days. Only the methanol and water leaf extracts significantly inhibited the formation of CML. The inhibitory activities of these two extracts were similar to that of aminoguanidine at 20 days and were almost similar to aminoguanidine at 40 days. Methanol and water extracts also demonstrated the highest inhibitory effects against formation of fluorescent AGEs at both 20 and 40 days.

Conclusion: Crude leaf extracts of M. oleifera have the potential to inhibit the formation of different types of AGEs.

2. The Prevalence of Obesity and Nutritional Practices among adolescents in Vhembe District

Brenda Baloyi, Lindelani Fumudzani Mushaphi

Background: The prevalence of overweight and obesity has become a global concern in developing and developed countries.

Aim: To determine the prevalence of obesity and nutritional practices among adolescents in Vhembe District.

Methods: The study design was cross-sectional. A total of 400 adolescents were selected randomly from four secondary schools. The researcher interviewed the participants using local language. Anthropometric measurements were taken on the same day of data collection. Data was analyzed using SPSS.

Results: About 66% participants were aged 14 to 15 years, 34% were aged 16 to 17 years while 5% were 18 years old. The majority of the participants did not drink alcohol and did not smoke cigarettes. About 56.5% had three meals while 37% had two meals per day. The most commonly consumed food were stiff porridge, tea, milk, white rice, apples, eggs, potatoes, cabbage, bananas and chicken. The pocket money was used to buy fat cakes, simba, chips, bread, cold drink, sweets, atchaar, fried fish, and biscuits. About 67% of participants had normal BMI, 20% were overweight, 7% were obese and 6% were underweight. The majority of the participants (90.5%) had unacceptable values of Waist to Hip Ratio (WHR) while 9.5% had acceptable values of WHR.

Conclusion: About 20% of the participants were overweight and 7% were obese. This was a high prevalence of over nutrition, which requires an immediate intervention. Over-nutrition is a risk factor of Non-Communicable Diseases that causes high morbidity and mortality in South Africa.

Key word: Prevalence, overweight, obesity, nutritional practices

3. Contribution of the local food environment to household food security in Mamelodi West, Pretoria

Christelle Bekker, Annemarie Viljoen

Introduction: The high percentage of urban South African households experiencing food insecurity is a cause of concern.

Aim: To explore and describe how the local food environment and the dimensions of food security (access, availability and utilisation) contribute to the food intake and dietary diversity of households in Mamelodi West.

Methods: A mixed methods approach was followed. GIS measurements, complimented by store observations, was followed by a survey questionnaire on food purchasing and consumption, the experience of hunger and coping strategies, and was collected from a convenience sample of 301 households. Focus group discussions gathered information on participants' perceptions of the three food security dimensions. Both descriptive and inferential statistical procedures were applied to quantitative data and focus group transcriptions were analysed with Atlas.ti software.

Results: Food availability is ensured by two large supermarkets and numerous formal and informal food outlets located in the area. Most respondents (36.1%) visited supermarkets once to twice a month for bulk purchases. Fresh produce is bought from local spaza stores mostly daily (53.8%) and from markets and street vendors 1-2 times per week (30.3%), confirming ease of access to stores in close proximity to households. Preliminary food intake data points to a low dietary diversity score and hunger was experienced by 23.7% of households during the past 12 months. Skipping meals and eating a smaller variety of food was used as coping strategies.

Conclusion: Although the majority (76.3%) of households were food secure, the food utilisation dimension poses challenges to their nutrition security.

4. Anthropometric Status and Nutrition Knowledge, Attitudes and Practices of Adults Living With HIV/Aids in Abeokuta, Nigeria

TK Bello, UE MacIntyre, GJ Gericke

Introduction: UNAIDS reports show that 19 million out of 35 million of people living with HIV/AIDS reside in Sub-Saharan Africa. Nigeria is the home of close to 20 % (3.5 million) of the affected population in Africa. The complex relationship between nutrition and death related to HIV/AIDS makes this study to be relevant.

Objective: To describe the anthropometric status and nutrition knowledge, attitudes and practices of adults living with HIV/AIDS who attend the Federal Medical Center (FMC) and Ijaye State Hospital (ISH) in Abeokuta Nigeria.

Methods: Data for this descriptive, quantitative exploratory study were collected from a total of 243 participants (75% females) aged 36.85 (±7.16) years living with HIV/AIDS, registered at the FMC and the ISH for antiretroviral therapy (ART). A self-administered questionnaire was used to obtain biographical data. Nutrition knowledge, attitudes and practices (KAP) were assessed using previously validated questionnaires. Weights, heights, mid upper arm circumference (MUAC) and triceps skinfolds (TSF) were measured in duplicate using standard procedures. Body mass index (BMI) was calculated as weight (kg)/height(m)2. Descriptive statistics were used to summarise the demographic data and nutrition KAP.

Results: Mean BMI (24.31 kg/m2) and TSF (31.26 mm) were within the normal range. 22% of the participants were overweight, 14% obese and 8% underweight. The majority of the participants had normal MUAC (93.22% males; 96.6 % females). Questions relating to meal planning, food purchasing and general nutrition knowledge elicited that participants' need-nutrition education (NE). The result was confirmed in the participants mean scores for nutrition knowledge (46.46±6.61) and attitudes (6.20±1.02). Approximately half of the participants (49.8%) did not know why cooked meat/fish/chicken sold on the street may not be safe and 83% had poor knowledge of meal planning. The usual practices of the participants' showed that 84.8 % were not smoking cigarette and 81.1 % were not consuming alcohol.

5. Quality of Life and Dietary Diversity of Adults Living With HIV/Aids In Abeokuta, Nigeria

Temitope Kayode Bello, GJ Gericke, U.E MacIntyre

Introduction: The human immunodeficiency virus (HIV) and acquired immune deficiency syndrome (AIDS) do not only threaten physical health but also the overall well-being in regard to the happiness, mental, moral and social satisfaction of infected individuals. Quality of life (QoL) plays a vital role in food intake and adherence to ART, which are common problems among people living with HIV/AIDS (PLWHA).

Objective: To describe the QoL and dietary diversity (DD) of adults on ART who attend the Federal Medical Center (FMC) and Ijaye State Hospital (ISH) in Abeokuta, Nigeria.

Methods: This descriptive, quantitative cross sectional study was conducted in two government hospitals in Abeokuta Nigeria. A total of 243 adults (25% males) aged ≥ 18≤ 50 years on ART were recruited and 177 completed the health related Short Form (SF-36) QoL questionnaire. A single day 24-hr recall was used to obtain DD. Individuals' DD was analysed using the FAO scale, individuals dietary diversity score (IDDS). The DD and constructs of QoL were summarised using percentages and 95% confidence intervals (p= 0.05).

Results: The mean overall QoL score was 65.34 ± 14.74 (95% CI= 63.15-67.52); 48.62% had poor physical functioning, 46.75% had limitation in their roles due to poor physical health while 56.24% reported their roles to be limited due to their emotions. The IDDS of the participants was poor; 65.89% had IDDS of ≤ 4. The result was confirmed by 66%, 63%, 99 %, 79% and 75% of the participants who did not consume fruits and vegetables, , organ meats, milk and milk products and eggs and egg products.

Conclusion: The need for improvement of QoL and DD were observed among the adults living with HIV/AIDS attending the FMC and ISH, Abeokuta, Nigeria. Tailored intervention should aim to improve QoL and DD of these people.

6. The compilation of quantitative food data on animal source foods and suggested use of the data in food consumption studies

Marina Bester, Hettie Carina Schönfeldt

Accurate consumption data is a key aspect of assessing the health of a population. However, assessing consumption of animal source foods (ASFs) has proved to be a challenging task, especially without accurate quantitative data on the physical composition and yield factors of ASFs. This study generated quantitative data including physical composition data (meat, bone and fat) and yield factors (to convert raw to cooked weight) for different chicken, beef, lamb marketplace servings (retail cuts) as well as lamb and mutton organ meats.

Yield factors calculated in this study were compared to values in the USDA Table of Cooking Yields for Meat and Poultry and showed a clear difference, proving the importance of generating country specific yield factors for ASF's. The data set presented in this article can offer assistance in South African food consumption research and ensure more accurate conversions from raw to cooked nutrient composition values. Furthermore this physical composition data will be translated into current National food-based dietary guidelines set for the consumption of animal source foods in South Africa.

Keywords: Food composition; Quantitative food data; marketplace servings; Food consumption studies; Animal source foods

7. Investigation of modifiable, non-modifiable and intermediate risk factors for the development of Gestational Diabetes Mellitus: A case-control study

Sharmilah Booley, Janetta Harbron, Fiona Herrmann

Gestational Diabetes Mellitus (GDM) is a common complication in pregnancy and can have adverse effects on both the mother and her offspring, including the development of non-communicable disease. There is a paucity of data regarding risk factors associated with GDM development in South Africa. The aim of this study was to investigate the modifiable, non-modifiable and intermediate risk factors associated with the development of GDM in a group of women living in Cape Town, SA. For these purposes, a case-control study design was used. Cases (n=127) were GDM women and controls (n=129) were pregnant non-GDM women. Cases and controls were pregnant women with single pregnancies and were matched for gestational age. A questionnaire developed specifically for this study as well as medical records were used to collect the following information: socio-demographic, anthropometry, clinical, dietary intake (non-quantified FFQ), medical history, family history of GDM and DM, physical activity, sedentary behaviours, weight history and perceived weight categories. Normality was tested using the Kolmogorov-Smirnov test. Descriptive statistics included means (±SD) or medians (IQR). To compare case and controls, t-tests, Mann-Whitney U test, Pearson's Chi-square tests and Fisher's exact tests were used. Odd ratios were computed for variables that differed significantly. A previous GDM diagnosis (OR=14.61), a family history of DM (OR=3.15), high maternal BMI (OR=2.27), hypertension (OR=2.76), advanced maternal age (OR=8.56), perceived overweight/obese (OR: 3.22) and being of mixed ethnicity (p= < 0.001) are risk factors for the development of GDM. These risk factors should be incorporated into the current GDM screening tool in SA.

8. Dietary Intake and Body Composition During the Competitive Season of Elite Footballers by Positional Categories

Ursula Botha, Friede Wenhold

Introduction: Knowing dietary intake of professional footballers is needed for individualised nutrition care. This study aimed to describe dietary intake and body composition of elite footballers by positional categories (competitive season).

Methods: A cross sectional study involving elite footballers from the premier soccer league (PSL) and varsity cup (VC) teams from the University of Pretoria. Weighed food records were performed on a match, training and rest day. Body composition was measured (bioelectrical impedance, Bodystat1500MDD).

Results: 46 Footballers (14 midfielders, 6 goalkeepers, 15 forwards, 11 defenders); mean age (23.1±3.8-y). Energy intake (measured in kJ/d and kJ/kg body weight/d) differed between training and rest days. The biggest difference was (5584.9 kJ/d, 101.04 kJ/kg/d and 8429.98 kJ/d, 143.01 kJ/kg/d respectively) on training and rest days between goalkeepers and forwards. On training day carbohydrate intake differed with 2.93 g/kg/d between goalkeepers and forwards. Protein intake showed no difference. Fat intake differed between goalkeepers and forwards for training with 0.97 g/kg/d and 1.62 g/kg/d on rest days respectively.

Body composition variables showed no difference between positional categories. The biggest difference for body fat percentage was 2.98% (goalkeepers versus midfielders) and 2.52% (goalkeepers versus defenders). [95% CI, p-value at 0.05]

Conclusion: Energy intake and body composition (% body fat) did not differ between positional categories. Individualized nutrition intervention may be beneficial in these footballers.

9. The relationship between the Marikana massacre and Nutrition: Eating habits of mine workers

Magda Botha

Nutrition is not the main objective of the mining sector, but it impacts on productivity and labour availability. Living conditions was one contributing factor to the Marikana massacre; miners claimed to be impoverished with decreased access to good nutrition. In 2003 Dias et al. published data on eating habits amongst mine workers. From 2013 to 2014, an evidence-based study had been conducted amongst 440 miners. The main purpose was to determine the eating habits of participants. Results were compared to that of 2003. Trained fieldworkers collected data on site through interviews and observations. More than half (55%) of the participants stayed alone and prepared their meals and lunch boxes. As 74% were sole breadwinners, they had to send money to family members at home: 32% of their income (2013), compared to 39% (2003). The amount of money used to buy groceries, increased with R197 per month over the last decade. Maize porridge and chicken were mainly consumed, altered with bread and red meat. Fruit and vegetables were not eaten regularly. Less than 1% consumed samp, beans and mageu. This was similar to the 2003 results. About 4 cups of coffee or tea (average of 5 teaspoons sugar per cup) were consumed daily. Caffeinated energy drinks were used during night shifts and when tired. More than 70% only ate two meals a day, whilst > 70% did not eat before coming to work or commencing their shifts. It can be concluded that eating habits of mine workers have not improved since 2003.

10. Can a self-directed weight loss initiative amongst female students result in behaviour change?

Chrisna Botha-Ravyse, Anita Lennox

Background: Higher physical activity is associated with better compliance to dietary prescriptions. Physical activity has a high drop-out which does not aid weight loss. Self-motivation is key to success and this led the way to self-directed weight loss strategies with dieting and exercising.

Methods: A fully mixed sequential dominant status design was used. Twenty four volunteer female students enrolled in a self-directed weight loss program. No dietary intervention or professional dietary advice was given. No exercise prescription but guidance was given. Quantitative information on physical activity participation, body image and satisfaction and anthropometric measurement gathered at baseline and eight weeks. Qualitative information on dietary practice, body image and body satisfaction as well as motivation was obtained. Follow-up twelve weeks after conclusion of study.

Results: No statistical differences were found between BMI and weight at baseline and 8 weeks, fat percentage did show a significant change. Body image score improved significantly. Students reported on feeling better about themselves and more motivated. Twelve weeks after the completion of the study only half the students complied with data requirements. Ten per cent gained weight, 52% remained stable, 23% lost more weight and 15% gained but lost again. Students reported on exercise being the remaining consistent intervention to maintain weight.

Conclusions: Self-directed weight loss strategies have a valuable role to play in changing behaviour and improving lifestyle. Exercise motivated to maintain weight loss. Education on the topics of nutrition and exercise will aid people to better plan and structure their weight loss strategies.

11. Local food systems, consumption patterns and nutritional outcomes - Implications for sustainable diets in rural South Africa

Nicole Claasen, Ernst Idsardi, Stefanie Lemke, Namukolo M Covic

In South Africa, household food insecurity co-exists with rising levels of obesity, reflecting poverty but also poor dietary habits. This research explores the linkage between local food systems (radius < 50km), consumption patterns and nutritional status of rural resource-poor households.

In 2013, six focus group discussions in two communities and 20 interviews with food chain actors were carried out. Food security, dietary diversity and body mass index were assessed in 79 households.

Most households experience severe food insecurity (63.3%) and low dietary diversity, yet high rates of overweight (22.4%) and obesity (27.9%) occur. There is sufficient availability of diverse foods locally but financial constraints limit household's access. Homestead gardening and livestock keeping hardly exist. Communities are surrounded by large commercial farms, providing some employment. Small-scale farmers within the communities mostly engage in cash crop production for overseas markets, not contributing directly to local food and nutrition security. Almost all food chain actors supply part of their produce locally, mostly to informal traders

and more independent food retailers. Most households purchase food occasionally from small local retailers but obtain their main purchases at large supermarkets that do not procure locally but through highly centralised distribution chains. Packaged and labeled foods sold at supermarkets are perceived by most consumers to be of higher quality compared to small local retailers.

Rural households encounter unhealthy and unsustainable diets, with local food systems not being fully utilized. Consumer awareness and provisions for local procurement by large supermarkets may stimulate local production and economic activity for more sustainable diets.

12. Infant feeding practices according to the World Health Organization Indicators for Assessing Infant and Young Child feeding practices

Cassandra Coutsides

Introduction: Malnutrition is still a major problem among children in South Africa. One of the reasons for the poor nutritional status of infants and young children in South Africa is because of the high prevalence of inappropriate feeding practices.

Aim: To determine whether the WHO Indicators of Infant and Young Child feeding (IYCF) are met by mothers/caregivers of infants younger than 12 months attending clinic a primary health care (PHC) in Boksburg.

Methods: A descriptive cross-sectional study was carried out among eligible mother/caregiver-infant pairs attending a PHC in Boksburg. Participants were selected using non-probability convenience sampling. A modified WHO IYCF questionnaire was administered in a face-to-face interview with mothers/caregivers. Data were analyzed using Epi Info 7.

Results: Of the total 99 mother/caregiver-infant pairs, 69 infants were younger than 6 months and 31 were 6-11 months old. Of the 99 infants, the majority (87%) had initiated breastfeeding immediately after birth. Only 23% of the infants were exclusively breastfed. Only 67% of infants aged 6-11 months were still being breastfed. Of the 31 infants in the 6-11 months age group, 53% were fed from 4 or more food groups. Minimum meal frequency (MMF) was adequate for 93% while minimum acceptable diet (MAD) was observed for 43% of infants.

Conclusion: This study revealed reasonably good infant feeding practices, except for the low level of exclusive breastfeeding. Although the MMF was adequate, the MAD indicator showed a lack of dietary diversity among the infants.

13. Nutritional Status and Treatment Related Chemotoxicity in Children with Nephroblastoma

Kelly Draper, Kirthee Pillay, Nicola Wiles, Larry Hadley

Background: Malnutrition presents a challenge in children with cancer. Sub-optimal nutrition exacerbates the mortality from infectious diseases and is a general cause of immunosuppression. Nutritional status on admission is important as treatment and clinical outcomes are affected. Weight is an inaccurate measure for patients with solid tumours as it is influenced by tumour mass.

Aim: This study aimed to assess the prevalence of malnutrition amongst patients with nephroblastoma and its influence on the prevalence, frequency and duration of chemotoxicity.

Methods: Seventy-seven children between the ages of 1-12 years diagnosed with nephroblastoma and admitted to Inkosi Albert Luthuli Central Hospital between 2004 and 2012 were studied prospectively. Nutritional assessment took place before treatment was started and included weight, height, mid-upper arm circumference (MUAC), triceps skinfold thickness (TSFT) and serum albumin. The administration of Neupogen® was used as a surrogate for haemotoxicity and the frequency and duration of use recorded.

Results: When patients were classified by weight-for-age, height-for-age and weight-for-height malnutrition was seen in 37%, 39% and 28% of patients, respectively. Using the parameters MUAC and TSFT the prevalence of malnutrition was 56% and 53% respectively. There was a significant relationship between the prevalence of chemotoxicity and MUAC. The mean frequency and duration of chemotoxicity was significantly higher in those defined as malnourished using MUAC.

Conclusion: Nutritional assessment in children with solid tumours should include MUAC and TSFT. Children with nephroblastoma who are defined as malnourished by MUAC are more likely to experience more frequent and longer periods of chemotoxicity.

14. Breakfast eating habits and anthropometrical measurements of grade 8 and 9 learners in Bloemfontein, South Africa

Elmine du Toit, Lucia Meko, Cornel van Rooyen

Introduction: Although breakfast is seen as the most important meal of the day, adolescents often skip this meal.

Aim: The aim of this study was to determine the breakfast habits and anthropometric status of high school learners.

Methods: Breakfast habits of 115 learners from Quintile 5 schools, were assessed by a self-administered questionnaire, and anthropometrical indices including weight, height, Waist Circumference (WC) and Neck Circumference (NC) were measured.

Results: Eighty six percent of the learners consumed breakfast 4-5 days of the week. Breakfast was mostly eaten at home before school. Refined cereals and white bread were preferred over fibre-rich and whole grain cereals, and fruit-juice over fresh fruit. Ninety two percent of learners reported that they consumed milk for breakfast. An encouraging 95% considered breakfast as important for their well-being. WC measurements showed that 14.3% were at risk for non-communicable diseases. A strong positive correlation (r=0.74) was found between WC and NC as well as between NC and Body Mass Index (BMI) (r=0.65) for both genders. The median BMI for both boys (20.8kg/m2) and girls (21.8kg/m2) were classified as healthy. The results did not show any statistically significant association between breakfast eaters and skippers: NC (p=0.6294), height (p=0.9161), weight (p=0.9162), and WC (p=0.7322).

Conclusion: Even though the majority of learners did consume breakfast regularly, the ideal would be to consume breakfast daily. NC was found as a useful screening tool to identify an increased BMI which can be used together with WC to indicate a risk for non-communicable diseases.

15. Anthropometric status, physical activity and semen parameters of healthy male volunteers

Elmine du Toit, Ronette Lategan-Potgieter, Jacques Raubenheimer

Introduction: High body adiposity and inactivity are associated with lower semen parameters.

Aim: To determine the influence of anthropometric status and activity level on semen parameters in young, healthy men.

Methods: Fifty apparently healthy young volunteers were included and anthropometric measurements (weight, height, neck-, waist- and hip circumference), activity levels and semen parameters (semen volume, sperm concentration, morphology, motility and pH) were recorded.

Results: Median age was 24 years (18 to 43 years), with 60% of participants presenting with an overweight/obese BMI and 46% with a neck circumference of ≥38cm. Fourteen percent of participants did not meet lower reference values for semen volume, 18% had lower sperm concentrations than the reference values, while 8% did not meet the lower reference limits for sperm motility. No statistically significant correlations were found between anthropometric measures and semen parameters. Fifty-four percent of participants reported high activity levels and the median time spent sitting during the week was 330.0 minutes/week. Eighty percent spent less than eight hours/day sitting during the week. The time spent sitting during the week, did not correlate significantly with sperm concentration (r=0.04, p=0.76) or motility (r=-0.17, p=0.24), but showed a weak negative correlation with sperm morphology (r=-0.29, p=0.05).

Conclusions: In this sample of healthy, young males the high incidence of overweight/obesity and larger neck circumference was concerning in terms of long term metabolic health. Anthropometric measures and activity did not however, influence semen parameters, other than a weak negative correlation between time spent sitting and sperm morphology.

16. Chemical Composition and Sensory Qualities of Wheat-Sorghum Date Cookies

Olukorede Esan, Adijat Sotunde

Introduction: Cookies are consumed in developing countries where macro- and micro nutrient malnutrition are prevalent.

Aim: To determine the proximate and sensory attribute of cookies produced from blends of flours of locally available food materials.

Methods: Functional properties, proximate and selected mineral of six formulated composite flours (A-F) from sorghum (SF), wheat flour (WF) and date palm flour (DPF) were determined using standard procedures. Samples A-D were blended using the following ratio (SF: WF: DPF; 80:20:25, 60:40:25, 40:60:25 and 20:80:25) respectively. Sample E (control) contained 100% WF sweetened with sugar while F is 100% WF and DPF. Sensory attributes were evaluated using nine point hedonic scale and data obtained were analyzed using Duncan multiple test at $p < 0.05$.

Results: Loose bulk density ranges from 0.48-0.56g/mL, packed bulk density =0.69-0.74g/mL, water absorption capacity =1.00-1.60g/g and oil absorption capacity =1.18-1.64g/g. Proximate analysis was as follows: moisture =4.32%-5.91%, ash = 1.81%-2.45%, fat =18.94%-20.52%, protein =8.68%-17.97%, fibre =2.72%-3.42% carbohydrate =52.65%-64.71%. Mineral compositions are as follows: calcium =6.31-8.10mg/100g, iron =0.08-1.00g and potassium =1.56-1.75mg/100g. Moisture content of the formulated cookies were within acceptable range. Ash, protein and calcium contents of the formulated samples were significantly higher than in control. Sample A had the highest iron while B had the highest potassium, control had the highest fat and carbohydrate . Through sensory evaluation, samples B, C and D were similarly acceptable with the control.

Conclusion: Enriching wheat flour with sorghum and date palm flour in cookies production improves its nutritional value.

Keywords: Wheat, sorghum, date palm, cookies

17. Body composition and intake associated with bone metabolism in young adolescents in a rural setting (Gauteng province, South Africa)

Michelle Fourie, Marlena Kruger, Gerda Gericke

Introduction: The critical period of adolescence growth will determine the amount of bone accrued and the bone health status progressing into adulthood. A low intake of nutrients associated with bone health and the presence of overweight and obesity may increase the risk for low bone density, fractures and ultimately osteoporosis.

Aim: To determine the relationship between anthropometry, bone mineral content (BMC), bone mineral density (BMD), dietary calcium intake and 25(OH)D3 levels in eleven and 12 year old children.

Methods: A cross-sectional descriptive study was carried out in two groups of children. The first group comprised of 70 children. Of the 70 children, 20 children were conveniently selected to form a sub-sample. Anthropometrical data (weight, height, skinfolds) and dietary data (quantified 24-hour recalls) were obtained. The children in the sub-sample additionally underwent body composition assessment (dual-energy x-ray absorptiometry; DEXA scan), a finger prick for 25(OH)D3 levels and the administration of the Calcium Counts food frequency questionnaire.

Results: Both study groups (N=56, n=20) presented with low BMIs as compared to the WHO recommendation. The girls had a higher BMI than the boys, with only one boy above the recommendation. The girls (N=56) had a statistically significant higher % body fat ($p = 0.0027$) and the girls exceeded the boys in all other body composition measurements, although not significantly so. The children had a sufficient macronutrient (24-hour recalls) intake but a deficient intake of calcium, phosphate, zinc and vitamin D (24-hour recalls and food frequency questionnaire). Of the sub-sample, 25% was vitamin D deficient and 60% of the group was vitamin D insufficient with 15% being vitamin D sufficient. The girls in the sub-sample had higher BMC and BMD, although not statistically significant.

Conclusions: The anthropometrical status and dietary intake of the children are of concern. However, there were no significant differences or relationships in the bone measurements and vitamin D status between the boys and girls.

18. Assessment of Dietary Behaviour and Body Composition of Professional Footballers in Northern Ghana

Frank Hayford, Kasim Abdulai, Charles Brown

Introduction: An important goal of athletes' everyday diet is to provide the

muscle with substrates as fuel. Hence, good dietary practice is essential in sports as it improves the quality of training, enhances performance, speeds recovery from injuries and optimizes adaptation.

Aim: The study assessed the dietary behavior and body composition of professional footballers in the Tamale Metropolis in Northern Ghana.

Methods: Cross-sectional study involving 119 footballers from five teams were randomly recruited by quota. Dietary pattern was assessed and behavior determined using food frequency questionnaire and SPSS respectively. Body composition was measured using omron bio-impedance body analyzer for variable such as muscle mass and BMI. Means and correlations were determined for anthropometric and all variables of interest. Statistical significance was set at $p < 0.05$.

Results: Mean age of footballers was 21.57±4.3 years with majority (58%) within 20-29 year group. Animal proteins and pure fruit juices were least consumed food groups with average consumption of (2/7) compared to cereals and grains consumption (4/7) per week. Mean percentage muscle mass and BMI were 41.73 ± 3.1 and 24.48±4.0kg/m2 respectively. Over 30% were overweight. Muscle mass negatively correlated with BMI ($p < 0.01$) whiles visceral fat correlated positively with BMI and body fat ($p < 0.01$).

Conclusion: Dietary pattern depicted low intakes of animal protein and fruits with high intakes of energy giving foods. Professional footballers need education on nutritionally balanced diet to prevent risk of iron deficiency aneamia and poor recovery from injuries, which may impact performance.

Key words: Footballers, dietary behaviour, body composition, northern Ghana

19. Association Between Dietary Pattern and Haematological Indices of Professional Footballers In Ghana

Frank Hayford, Kasim Abdulai, Charles Brown

Introduction: Several factors, including dietary pattern is paramount to determination of blood iron status and other haematological profile. Because iron plays an important role in aerobic capacity and performance due to its role as an oxygen transporter to working muscles, good dietary iron sources are essential to meet the energy demands of training and performance of footballers.

Aims: To determine the association between dietary pattern and haematological indices of professional footballers in the Tamale Metropolis in Northern Ghana.

Methods: Cross sectional study, with 119 footballers aged between 18 and 40 years recruited randomly. A validated food frequency questionnaire used to source information on frequency of consumption of foods and beverage. Haematological indices were measured by Sysmex 21KN cell automated cell analyzer using 5ml venous blood. Pearson correlation was used to determine associations and $p < 0.05$ was considered statistically significant.

Results: Frequent consumption of carbohydrate rich foods (4/7) compared to animal proteins (2/7), vegetable protein (3/7) and pure fruits juices (2/7) per week. Majority (91%) had low mean corpuscular volume (MCV) though most footballers had normal haemoglobin (98.3%) and ferritin (77.7%) levels. Plant protein consumption significantly correlated ($p < 0.05$) with red blood cells, haemoglobin, and serum ferritin. Animal protein consumption however was vice verse.

Conclusion: Even though most footballers had normal haemoglobin and ferritin levels, most had low MCV, indicating possible microcytic anaemia. Hence, the need for frequent consumption of high biological protein foods to prevent risk of early fatigue during training and competitions.

Key words: Footballers, dietary pattern, haematological indices, anaemia, Ghana

20. Feeding habits and nutritional status of children (0-5 years) of low income mothers using biomarkers in saliva

Frank Hayford, Florence Eto, Charles Brown

Background: Research on the effect of nutrition status on saliva have indicated; the degree of malnutrition, period when malnutrition takes place, dietary pattern and consistency of diet, effect on salivary gland growth and function, effects on different salivary glands as well as deficiencies of specific macro and micro-nutrients.

Aim: The study assessed feeding habits and macro and micro nutrient status of children (0-5 years) of low income mothers living in low socioeconomic income suburb within Accra metropolis of Ghana using saliva bio-markers.

Methods: Purposive cross sectional study involving seventy-three children. Dietary habits were assessed using a validated food frequency questionnaire. Macro and micro nutrient status measured using whole un-stimulated 5ml saliva analyzed for deficiencies for micro-nutrients, total protein, albumin and amylase.

Results: Majority of children (32.9%) ages were 25 and 36 months. Most (54.8%) mothers earn 20-30 cedis (5-8 USD equivalent) daily. Most (95.9%) children breastfed, but only 9.6% did exclusively for six months. Most children (63%) fed thrice daily from varied food groups. Most children had normal average salivary pH, albumin, amylase and total protein (7.46 ± 0.867, 2.920 ± 1.353 g/L, 6.386 ± 6.2676 g/L and 99.114 ± 177.816 U/L) concentration levels respectively.

Conclusion: Most children had good nutritional status despite mothers low income status implying that prenatal nutritional education during pregnancy may be yielding some beneficial results. Mothers should be encouraged to attend prenatal clinics during pregnancy frequently, irrespective of their socioeconomic status.

Key words: low income mothers, bio-markers in saliva, nutritional status, children, nutrient deficiencies, Ghana

21. Dietary Iron, folate and vitamin B12 intakes in pregnant adolescent girls

Freda Intiful, Edwin Wiredu, Matilda Asante, George Asare, David Adjei

Introduction: Folate, vitamin B12 and iron deficiency in pregnancy can present with adverse pregnancy outcomes. The pregnant adolescent girl is more at risk of developing these deficiencies because of the increased nutrient demands of both the period of adolescence and pregnancy. Data on dietary intakes of pregnant adolescent girls are scanty in Ghana.

Aim: The aim of this study was to assess the dietary intakes of folate, iron and vitamin b12 in pregnant adolescent girls.

Method: A total of 223 pregnant adolescent attending antenatal care in

3 hospitals in the Greater Accra Region were recruited. A semi-structured questionnaire was used to obtain information on their background. Dietary intake assessment was done using a 3-day 24-hour dietary recall. The microdiet and the Ghanaian food composition tables were used in estimating nutrients. Descriptive statistics were used to summarize data and inferences drawn using Pearson's correlation. Girls who had intakes below Estimated Average Requirement recommendations were categorized as having low intakes.

Results: The results indicated median intakes of iron to be 8.5mg (IQR=0.85-28.35), vitamin B12 to be 1.41µg (IQR= 0-13.37) and folate to be 96.36 µg (IQR=16.42-436.59). None of the girls were able to meet the requirements for folate. Only 1.35% and 22.50% met the requirements for iron and vitamin B12 respectively. Significant correlations were observed between iron and folate intakes, $r=0.327$, $p < 0.05$.

Conclusion: Dietary intakes of iron, folate and vitamin 12 were extremely low among the pregnant adolescent girls.

Keywords: adolescent, pregnant, iron, folate, vitamin B12

22. Effects of nucleotides on immunity, physiology and performance of athletes

Peter Koeppel

Exercise can have both positive and negative effects on the body's immune function and the susceptibility to minor illnesses. Moderate activity may enhance immune function above sedentary levels; whereas excessive amounts of prolonged, high-intensity exercise can impair immune function due to increased cortisol levels and lowered IgA. However, appropriate nutrition, i.e. increased nucleotide levels can diminish the negative effects of heavy exercise. An adequate amount of nucleotides greatly influences the formation and reactivity of immune cells. A clinical trial, investigating the effect of exercise on the immune system and functioning of host protection will be discussed.

Improved physiological status of athletes is dependent on a number of factors including efficient energy transportation (ATP, GTP and UTP); efficient digestion and absorption of nutrients from the gut; the optimum structure of the gut as well as the enzyme activity and composition of flora in the gut. Oxygen supply is also critical for improved performance due to an increase in lactic acid and subsequent lowering of the body pH in the absence of sufficient oxygen. Once again, discussion of clinical trial results will show that nucleotide supplementation enhances the functioning of all of the above factors resulting in better performance by athletes.

23. Parental responsibilities and barriers to their participation in infant and young child feeding: Malawian fathers' perception

Wezzie Kumwenda, Gerda Gericke, Jane Muchiri

Background: Inappropriate infant and young child feeding practices still persist in Malawi. To improve on the current feeding practices, it is important to involve both parents.

Aim: To explore and describe fathers' perception on the responsibilities of mothers and fathers in infant and young child feeding (IYCF) and identify factors that hinder their involvement.

Setting: Five agriculture extension planning areas of Mzimba North District, Malawi.

Study design: Phenomenological in the qualitative domain.

Participants: Fathers (N=40) with children aged zero to 24 months.

Methods: Five focus group discussions were conducted using an interview guide with open ended questions. Data were analysed using Creswell's method. Study had ethical approval from NAS ethics (No. EC151204-26).

Findings: Providing food for the family was identified as the main role of fathers in IYCF. The other roles included supporting the breastfeeding mothers and helping in feeding the older children. Food preparation, feeding the children and obtaining information on IYCF were considered the mothers' responsibilities. The pressure to embrace dominant cultural definition of masculinity was identified as the major barrier to fathers' involvement in IYCF as most activities were considered feminine. Other barriers to parental involvement included financial constraints, inadequate nutrition knowledge on IYCF and poor relationships within the home.

Conclusion: Most fathers were aware of the parental responsibilities in IYCF. However, cultural, economic and inadequate nutrition knowledge appear to hinder optimal parental involvement in proper IYCF. There is need for provision of appropriate nutrition knowledge on IYCF to both parents to enhance their participation in IYCF.

24. Contextual nutrition education materials for grades 5 and 6 teachers in the Bronkhorstspruit district

Mojisola Kupolati, Gerda Gericke, Una MacIntyre

Introduction: Lack of up to date instructional materials has been identified as one of the hindrances to effective nutrition education (NE) in schools.

Aim: To develop a culturally relevant, context specific NE manual for use by teachers in teaching nutrition to Grade 5 and 6 learners in the Bronkhorstspruit district.

Methods: Mixed methods were used to conduct a needs assessment among learners (n=354) and teachers (n=24) who taught nutrition to Grades 4 - 7 learners. The information obtained was integrated with constructs of the Social cognitive theory (SCT) and the Meaningful learning model (MLM) and incorporated into the current curriculum of the Department of Basic Education (DoBE) to develop a contextual nutrition education manual (NEM) with supporting materials.

Results: The needs assessment revealed a lack of up to date instructional materials, learners' inadequate nutrition knowledge, teachers' poor knowledge on certain nutrition questions and inadequacy in teaching nutrition in the learners' context. The developed NEM was accompanied by a picture book, learners' work books and posters. The NEM and the supporting materials were written in simple English, with pictures illustrating nutrition concepts. The concepts of the SCT and MLM were represented by icons appropriately positioned in the NEM to consolidate relevant nutrition messages. Critical process and impact evaluation formed part of the implementation.

Conclusions: The developed NEM and the supporting materials appeared to meet the teachers' need for adequate instructional materials as was remarked in the implementation (2015) of the NEM in the school.

25. Artificial sweeteners, resting metabolic rate, insulin resistance and body weight in healthy female students

Ronette Lategan-Potgieter, Liska Robb, Marizeth Jordaan, Aldiné Coetzer, Marsy Greyling, Ashleigh, Lara Jacobs, Johanrie Swart, Dries Groenewald, Jacques Raubenheimer

Artificial sweeteners were developed to facilitate weight loss and improve glycaemic control in individuals with diabetes mellitus and have been used for many decades, but the effect on resting metabolic rate (RMR), insulin resistance (IR) and body weight remains unclear.

Objectives: This experimental before-after-study determined the effect of artificial sweetener use on RMR, glucose tolerance and body weight of healthy female volunteers.

Methods: A convenience sample of twenty healthy female dietetic students were included after ethical approval for the study was obtained. Data were collected in a comfortable, temperature controlled environment with participants in a resting, fasting state. RMR, Homeostasis Model Assessment-IR (HOMA-IR) score and body weight were determined before and after one month of artificial sweetener use in volunteers, not previously exposed to artificial sweeteners. Three hours prior to RMR measurement, participants received an identical light meal.

Results: A non-significant increase of 357 kJ (p=0.08) in mean RMR and improvement in mean HOMA-IR score from 2.63 to 2.24 (p=0.34) was observed after one month of using artificial sweeteners. Mean weight of the sample was significantly lower at baseline (62.8 kg) than post-intervention (63.6 kg) (p=0.0007), with the majority of participants gaining weight (16/20; 80%).

Conclusion: Except for a small but significant increase in body weight, no statistically significant effect on RMR or HOMA-IR was found after one month of using artificial sweeteners.

26. Dairy for optimal nutrition in South Africa 'Have milk, maas or yoghurt every day'

Christina Leighton, Maretha Vermaak

The Food-Based Dietary Guideline (FBDG) 'Have milk, maas or yoghurt every day' has provided the dairy industry with an opportunity to promote dairy as part of a healthy diet to all South African consumers. The 'Interaction at Clinics' campaign, managed by the Consumer Education Project of Milk SA, is aligned with the Department of Health's food-based drive to nutrition education. 'Have milk, maas or yoghurt every day' is presented to the target audiences within the framework of the eleven FBDG.

The campaign has two elements/target audiences:

1. Educational presentations at government clinics and hospitals:

The target audience for the project is LSM 3-7 at government clinics and hospitals in various provinces throughout South Africa. This campaign was initiated in 2014 and is ongoing in all nine provinces.

2. Training of Nutrition Advisors and health promotors

Nutrition Advisors and Health Promotors are individuals with basic nutrition and health education who are employed by the DOH and work in government clinics. The dietitian of the CEP trains the Nutrition Advisors and Health Promotors who, in turn, educate patients and visitors at their respective government clinics. They are also equipped with a set of educational tools for use at their respective clinics.

The key communication message is 'Have milk, maas or yoghurt every day' plus associated nutritional and health benefits of dairy and demonstrates how dairy can easily be added to daily meals for added nutrient value.

27. Modified Maize Starch - a cause for concern in baby foods?

Malory R Links, Joelaine M Chetty, Averalda E van Graan

Infants have high nutritional requirements and only consume small amounts of food, therefore they require nutrient–dense foods. Modified maize starch (MMS) is added to food to provide texture, thicken, suspend solids and stabilize emulsions. However, due to its excellent water binding properties, MMS could be used as a bulking agent in some baby foods, replacing real food ingredients and thereby reducing nutritional quality. Thus, the objective was to determine the quantity of baby jar foods containing MMS in the updated South African Food Composition Tables and to compare their data quality with baby foods that do not list MMS as an ingredient.

FAO guided quality checks were applied to nutrient composition of baby foods. The sum of proximates quality check was used to highlight baby food's nutrient composition that did not conform to set standards. Ingredient information lists on non-conforming baby jar foods were examined to identify the presence of MMS.

Of the 85 baby jar foods updated, 59% (n=50) sum of proximates quality check did not add to 100 g, while 32% (n=27) foods did not meet the 97 g quality check limit. Label information revealed that MMS was a major ingredient in 67% of foods that did not meet quality requirements.

FAO guided quality checks could be a good tool for quality assurance of nutrient data listed for complementary baby jar foods. The results from the sum of proximates quality check and label information warrants further investigation into the addition of MMS to complementary baby jar foods.

28. Dietary Intakes of Rural Pregnant Women in Vhembe, Limpopo Province

Una MacIntyre, Jonathan Chevrier, Riana Bornman, Fraser Gaspar, Stephen Rauch, Brenda Eskanazi

Introduction: Despite the importance of maternal diet to the health of mother and baby, South African dietary data during pregnancy is lacking.

Objective: To describe food, energy and selected nutrient intakes of pregnant women in Vhembe, Limpopo Province.

Methods: Dietary intake data, using a validated food frequency questionnaire with one month recall period, were obtained from 751 women at delivery during the Venda Health Examination of Mothers, Babies and their Environment (VHEMBE) study. Nutrient analysis was conducted using the FoodFinder 3 program to which fortified nutrient values for maize meal and bread were added. Micronutrient intakes were compared to the Estimated Average Requirements (EARs) (National Academies, 2011).

Results: After outlier detection of energy intakes, 16 participants were excluded. Mean age and post-delivery body mass index were 26.4 (SD=6.3) years and 27.6 (SD=5.4)kg/m2 Median (25th;75th percentile) energy intake

was 9491 (6970;12861) kJ, providing a median 78 (57;108)% of estimated energy requirements. Protein (median=70 (67;75)g) provided 13% of energy intake. The EARs for calcium and iron were not met by 96% and 22% of the women while those for vitamin A, folate and vitamin B12 were not achieved by 40%, 42% and 45%. Stiff maize meal porridge was consumed by 99% of participants with a median daily intake of 700(429;1090)g.

Conclusion: The diet of VHEMBE mothers was energy dense, with maize meal porridge as the main source of energy. The percentages of women at risk of deficiencies of vitamin A, folate, vitamin B12 and calcium are a concern.

29. Prevalence of hunger and coping strategies in households with children aged 3 to 5 years in Vhembe District

Sedzani Elsie Madala, Lindelani Fhumudzani Mushaphi

Background: United Nation Children's Fund (2005) reported that one billion of children live in hunger everyday and 300 million children are suffering from hunger.

Aim: The aim of the study was to determine the prevalence of hunger and coping strategies in the household with children aged 3 to 5 years in Vhembe District.

Design: The study design was a descriptive survey. Six villages were selected using systematic random sampling. All households with children age 3 to 5 years were included in the selected villages. Data was analyzed using Statistical Package for Social Sciences (SPSS).

Results: About 46.6% of the households were moderately hungry, 28.3% were suffering from severe hunger, while only 25.1% of the households were hunger free. Majority of households (69.9%) reported that they did not have adequate money to buy food. About 45% of the households reported that their children ate less less than they felt they should due to a lack of money to buy food. Furthermore, about 44.9% of the households reported that they limit portion sizes at mealtimes, while 31.4% reported that they reduce the number of meals eaten in a day.

Conclusion: The most commonly used coping strategy by households when they ran out of food or money to buy food was relying on less preferred and less expensive foods.

Key words: hunger, coping strategies

30. Dietary Diversity in Household with Children Receiving Child Support Grant in the Rural Households in Vhembe District

Tjale C Mahopo, Cebisa N Nesamvuni, Tirhani A Masia, Tshifhiwa C Mandiwana

Background: The diet of many South African children mostly comprise cereals with limited micronutrient rich foods such as fruits, vegetables and animal-source proteins.

Aim: To determine the dietary diversity in household with children receiving child support grant in the rural households in the Thulamela municipality, Vhembe district.

Methods: A cross-sectional survey was used. HDDS questionnaire were used to gather data. The study was conducted in Itsani and Sidou villages outside Thohoyandou. A total of 120 selected households were interviewed to provide information on children's dietary diversity, food consumption and socio demographic information. Data was analysed and presented as correlation, percentages, means and SDs.

Results: The results indicates that children (80%) were aged between 1-5 years. Most household (70%) had 5-6 family members. Only 5% of the household had average income of more than R4000.00 per month. Household spent about R500.00-R1000.00 to buy food. More than 50% of mothers had secondary education with only 20.8% having tertiary qualifications. Low or poor dietary diversity was reported in 63% of the children (less than or equal to 3 food groups). Source of income increased the purchasing power (p=.255; r-.005) of food in the household. Introduction of other source of income showed improvement with dietary diversity of the children (p=197; r=.031).

Conclusion: There was poor dietary diversity score in children receiving child support grant in Itsani and Sidou villages. Introduction of other sources (markets etc) of income improved the dietary intake.

Key word: dietary diversity child support grant, socio economic status

31. Body Composition and Physical Performance in Black Adults from the North-West Province

Phumudzo Mamphwe, Sarah Johanna Moss, Herculina Salome Kruger

Introduction: The age-related loss of muscle mass and strength resulting in weakness and poor function is receiving increasing attention with ageing of the population globally.

Aim: To determine the association between body composition, diet and physical activity data collected in 2005 and physical performance in 2015 from black adults in the North-West Province.

Methods: In this longitudinal study, 1353 adults (460 men, 893 women) 32 to 93 years of age in 2005 participated. Their weights and heights were measured and body mass index (BMI) calculated. In 2015 chair rise, 6 meter walk and grip strength tests were performed. Descriptive statistics and correlations were used to analyze the relationship between body composition variables, dietary intake, physical activity score and physical performance tests.

Results: In 2015, 924 individuals were followed up (287 men; 637 women). Among men total protein intake in 2005 had a positive correlation with walk speed (m/s) in 2015 ($r=0.23$, $p= 0.049$), weight, as well as height in 2005 had a positive correlation with grip strength($r= 0.31$, $p= 0.007$ and $r=0.40$, $p < 0.0001$, respectively). Among women weight and height in 2005 had a positive correlation with grip strength in 2015 ($r=0.36$, $p < 0.0001$ and $r=0.38$, $p < 0.0001$, respectively). Physical activity in 2005 had a positive correlation with walk speed (m/s) in 2015 ($r= 0.17$, $p=0.026$).

Conclusion: Body composition predicts grip strength in black men and women, whereas protein intake in men and physical activity in women were predictors of walk speed.

32. Prevalence of Hypertension and Associated Risk Factors among Maasai Communities in Simanjiro, Tanzania

Juliana Mandha, Joram Buza, Pammla Petrucka

Introduction: Non-communicable diseases are rising in low income countries. Information on the risk factors at the community level is of paramount importance to enable strategic preventive programs. This study was conducted within a rural pastoral community of Maasai in Simanjiro

District of Tanzania to determine prevalence of hypertension and its determinants.

Methods: This population based cross-sectional study included 561 Maasai participants. Consenting adults (≥ 25 years) were interviewed using the World Health Organization stepwise survey instrument.

Results: Average age (years) of the participants was 39±13.9. The prevalence for hypertension was 21.4%, 95% CI [18,25]. Systolic blood pressure was significantly ($p < 0.05$) associated with diastolic blood pressure, heart rate, weight, height, body mass index, waist circumference, abdominal obesity, fruit servings per day, and vigorous work done. Majority (96.26%) of Maasai participants were physically active, with those in the 24-34 year age group having higher metabolic equivalents (10563.92±7552) than the 65+ group (4852.09±5835.272) ($p < 0.0001$). Hypertensive participants showed lower metabolic equivalents (179.2±107.7) than their non- hypertensive counterparts (297.6±53.1). The majority of participants were within normal weights, but body mass index differed according to age groupings ($p = 0.0454$) and hypertensive status ($p=0.0063$). Hypertensive participants had significantly ($p=0.0136$) higher blood glucose levels. Fruits and vegetable intake was similar among hypertensive and non- hypertensive participants; however, there was a significant difference across age groups ($p=0.0085$).

Conclusion: Hypertension prevalence among the rural Maasai community was found to be high. It is imperative to put strategies in place for primary prevention and targeted treatment of hypertension.

33. Household's Food Handling Practices of Mudimeli Village, Makhado Municipality, Vhembe District

Tshifhiwa Cynthia Mandiwana, Humbulani M Ramaru

Objective: To determine food handling practices in households of Mudimeli village.

Method: The study design is descriptive. This study described the food handling practices of Mudimeli village households. The sample of 120 households was systematically selected. A questionnaire and observational checklist were used to collect data. Questionnaire consisted of questions relating to socio-demographic information and food hygiene practices. Observational checklist consisted of personal hygiene and environmental hygiene.

Results: 80% of food preparers does not follow the proper food handling before and during preparation. The study revealed that 83.3% of the participants do not store food immediately after shopping even though all had refrigerators. The findings also revealed that most of the food preparers do not thaw frozen foods properly, they also do not cook at the required temperature. All (100%) participants had dirty aprons. 56.7% of the participants had long nails whereas 43.3% had trimmed nails. 60% of the participants were preparing food with uncovered hair and only 30% had their hair covered. 10% of the participants had partly covered hair during food preparation.

Conclusion: The food handling practices of Mudimeli households are improper. Most of the participants were not following the proper methods of storing and preparing food. Majority of the food preparers were not hygienically clean during preparation so is their kitchens and most of participants had the surface area which was dirty.

Keywords: Food handling, food borne illness, bacteria, hygiene & environment.

34. Nurses' challenges with managing unintentional weight loss in older adults in long-term care facilities (Cape Metropole)

Maritha Marais, Corne de Haas, Elizma van Zyl

Introduction: Unintentional weight loss (UWL), common in older adults, impacts negatively on quality of life and results in increased morbidity and mortality.

Aim: To determine knowledge, perceptions and practices of nursing staff regarding identification and management of UWL in older adults residing in long-term care facilities (LTCF) in the Cape Metropole.

Methods: This cross-sectional, descriptive study design used simple random sampling to select LTCFs (N=15). A self-administered questionnaire investigated knowledge, practices and perceptions of nursing staff (N=108). Data from different categories of nursing staff and facility types were compared, and barriers to managing UWL identified.

Results: Nursing staff from subsidised and non-subsidised LTCFs had insufficient knowledge (38%) regarding weight loss. Although nursing staff had positive perceptions regarding identification and management of UWL, 45.8% had misperceptions that malnutrition is uncommon and that having a poor appetite is normal for older adults (45.4%). A significant difference ($p < 0.05$) was found in a minority of perception statements among different staff categories and facility types. Poor practices included residents having limited meal choices and that plate waste was reported only when more than ½-¾ of the meal wasn't consumed. Of the 87% (n=94) of participants who weighed residents, only 60.6% (n=57) did so regularly and only 22.2% (n=24) could correctly identify a significant weight loss. Nutrition screening and assessment tools were rarely used (3.8-16.8%).

Conclusion: Nursing staff require empowerment through continuous education and being supported with applied standard procedures to enable early identification and addressing of UWL and malnutrition in older adults residing in LTCFs.

35. Dietary diversity and nutrition practices of recipients of a food bursary at the University of the Free State, South Africa

Lucia Meko, Marizeth Jordaan

Background: Due to the high cost of tertiary education, many South African students rely on financial assistance for academic and living expenses. In order to address food insecurity on its campuses, the University of the Free State (UFS) initiated a food bursary called the No Student Hungry (NSH) campaign.

Aim: The aim of this study was to determine the dietary diversity and nutrition practices of the NSH recipients at the UFS.

Methods: An observational descriptive study was conducted at the UFS on 48 recipients of the NSH in 2014. Dietary diversity was measured and structured questionnaires were used to determine the students' nutritional practices. Descriptive statistics, frequencies and percentages for categorical data, were calculated using SAS software (SAS Institute Inc., Cary, NC, USA).

Results: Most students had a high (51%) and medium (43%) dietary

diversity. Starchy foods were consumed by most students (73%), followed by protein foods (69%). None of the students had consumed legumes on the day preceding the day of the interview. Over half of the NSH recipients reported that they did not receive any extra money for food (58%) other than that offered by the food bursary. Most students purchased one meal once a day (44%). Sharing of food costs and cooking was used as a coping mechanism by 77.1% and 47.9% of the students, respectively.

Conclusion: The results indicate that food assistance offered to deserving students assists in preventing hunger and in improving dietary intake.

Key words: food insecurity, dietary diversity, food bursary

36. Resveratrol suppresses hyperglycemia-induced activation of NF-κB and AP-1 via c-Jun and RelA gene regulation

Zinat Mohammadpour

Background: Resveratrol (RSV) plays many important biological functions in cells. The anti-inflammatory effects of RSV are widely known. In this study, we investigated the molecular mechanisms underlying anti-inflammatory effect of RSV, by assessing the gene expression of RelA and c-Jun- subunits of NF-κB and AP-1 transcription factors.

Methods: HepG2 cells were settled in serum free medium with high concentrations of glucose (30mM) and insulin (1 μM) an overnight and then incubated with RSV (5, 10 and 20 μM) for 24and 48h. Real-time quantitative polymerase chain reaction (qRT-PCR) was used to determine the RelA and c-Jun expression.

Results: RSV diminished hyperglycemia stimulated expression of c-Jun dose dependently after 24 and 48h ($p < 0.005$). Also, RelA gene expression was dose dependently decreased in all RSV doses after 48h incubating ($p < 0.005$).

Conclusion: Our results indicated that RSV may reduce NF-κB and AP-1 activity via RelA and c-Jun gene regulation. This investigation introduces RSV as a preventative and therapeutic agent for the inflammatory diseases.

Keywords: AP-1, c-Jun, inflammation, NF-κB, RelA, Resveratrol

The authors have no conflict of interest

37. Changing the tide on infant mortality and morbidity through breastfeeding support, promotion and protection: A case study from KwaZulu-Natal Province, South Africa

Lenore Spies, Sthandiwe Monegi, Ronel Sorgenfrei

Objective: To present the experience of KwaZulu-Natal (KZN) Province in changing child health outcomes by focussing on infant feeding, specifically breastfeeding and exclusive breastfeeding.

Background: In the 1990's breastfeeding was not encouraged in the HIV infected population. HIV positive mothers received six months free infant formula as part of the National PMTCT programme during this period. This impacted safe infant feeding practices with an increase in child deaths from preventable disease such as diarrhoea and pneumonia.

KwaZulu-Natal Intervention: The increasing evidence prompted the KZN Provincial Government to reassess the Provincial Infant and Young Child Feeding (IYCF) in context of HIV Policy and subsequently stopped the issuing of routine free infant formula to HIV-positive mothers effective 1 January 2011 (DoH 2010).

Progress: Since the policy change, KwaZulu-Natal Government with partners has implemented projects (KwaZulu-Natal Initiative for Breastfeeding Support (KIBS) and Mother-Baby Friendly Initiative (MBFI) plus Project). These projects aim to increase breastfeeding rates in the province and improve child survival. Both projects focus on human milk bank strengthening in the Province.

The Made by Mom campaign is implemented as part of the projects to create awareness in the community about breastfeeding and human milk banking.

Results: Data from the KIBS 2015 qualitative study will be presented indicating exclusive breastfeeding rates at 14 weeks to be at.

38. Food labels of different food manufacturers in South Africa: Are they complying with health regulations?

Selekane Ananias Motadi, Asnath Tirhani Masia, Solomon Ngoako Mabapa, Lindelani Mushaphi, Vanessa Mbhatsani

Introduction: The South African Department of Health defines a food label as any tag, brand, mark, pictorial, graphic or other descriptive matter, which is written, printed, stenciled, marked, embossed, impressed upon, or permanently attached to a container of a foodstuff, and includes labelling for the purpose of promoting its sale or disposal. Food labelling is the primary means of communication between the producer and seller of food and the purchaser and consumer.

Aim: To estimate the prevalence of nutrition labeling and investigate the compliance of food manufacturers with the food labelling regulation (R146) of South Africa.

Methods: Convenience sampling was used to select food categories such as breakfast cereals, sweet biscuits, dairy products, canned vegetables and carbonated soft drinks. A checklist was developed to evaluate the food label information on the food package against the food labelling regulation with the purpose of ascertaining whether food manufacturers comply with the food regulation.

Results: All 200 (100%) food packages were labelled with net weight. However, only seven had gross weight labelling. Out of the 200 (100%) food packages observed, 136 (68%) had allergen advice and complied with the food labelling regulation (R146); 192 (96%) of the packages had the list of ingredients and only 8 (4%) of the food packages in the sweet biscuits category did not have a list of ingredients.

Conclusion: Most food manufacturers observed in South Africa complied with South Africa's food labelling regulation (R146). However, noncompliance was observed in labels such as sweets, biscuits and carbonated soft drinks categories. Some food manufacturers still used food labelling regulations (R2034).

39. How a manufacturer reduced salt in savoury products in response to Salt Regulations

Duduzile Mthuli

Background: The reduction of salt intake has a positive effect on

hypertension. Regulations were published in March 2013 that required a reduction of up to 33% in 35 variants of savoury products by June 2016.

Aim: Share information on the human and capital resources required.

Scope: The discussion will only include the work done by teams of different professional expertise on savoury products by one manufacturer.

Method: Executive management held periodic meetings to monitor progress.

Research & Development: A reduction of salt alone, lead to a dramatic decrease in product liking. The R&D team had to ensure that no significant loss in product liking occurred.

Marketing: Managed communication strategy and assets (i.e. pack design, advertising etc).

Packaging: The old packs were redesigned to articulate to the consumer-updated ingredient statements and nutritional information.

Quality assurance: Developed new documentation and training of personnel including new specifications for raw materials, product testing protocol, factory standards etc.

Supply Chain: Modifications to factory layout and equipment was required.

Results: 3 000T of salt was removed from bouillon cubes; instant sauces and soups. More than 16 000 man-hours were invested and R15 million was spent on developing the products. Certain raw materials (packs and ingredients) became redundant with re-formulation and was replaced by new.

40. Planning a theory-based nutrition education programme for type 2 diabetes adults living in a resource-limited setting of South Africa

Jane Muchiri, Gerda Gericke, Paul Rheeder

Background: Patient centred, theory based education is essential to empowering patients to take charge of their condition.

Aim: To plan a cultural-relevant, needs tailored and theory-driven nutrition education programme (NEP) for adults with type 2 diabetes (T2DM) living in a resource-limited setting.

Methods: A two phase process was used. A needs assessment (Phase 1) was done with 31 T2DM patients and ten health professionals at two community health centres (CHCs) (Moretele, North West Province). The results and evidence from literature were used to design the NEP (Phase 2). Programme goals and objectives were based on identified problems/needs. Planned NEP components, content, venue, duration and delivery format incorporated participants' recommendation for NE, identified facilitators and barriers to dietary adherence. NEP activities and education tools/materials were planned for cultural appropriateness and a low-literacy audience. Study had ethical approval (no. 164/2008) from Faculty of Health Sciences (University of Pretoria) Ethics committee.

Results: Social Cognitive Theory, Health Belief Model and Knowledge Attitude Behaviour theories were found suitable to underpin the NE. NEP was planned for implementation over a long duration (one year), to be of high intensity (26.5 contact hours) and for delivery at CHCs. The NEP comprised the curriculum (8-weekly, 2-2.5 hour sessions); follow-up sessions (monthly and bi-monthly); education materials and vegetable gardening demonstrations. With good glycaemic control as overall goal, the NEP aimed to facilitate the ability in the patient to act (control food portions, consume more vegetables and fruits and balanced meals) by providing opportunity to gain knowledge related to diabetes and diet, practise food related skills and gain skills in problem solving through the NEP components. Coloured education tools were selected and appropriately adjusted for teaching. Pamphlet and wall/fridge poster were designed for use at home. Interactive delivery (group discussions, hands-on activities, demonstrations, food-displays) and the use of local foods and language were planned.

Conclusion: A comprehensive need assessment is the basis for planning theory-based participant customised NE interventions for people with T2DM. High participants' NEP satisfaction and perceived benefits and some significant dietary changes consequent to implementation support this conclusion.

Key words: Type 2 diabetes, nutrition education, intervention, behaviour theory, planning

41. Micronutrients intake of adults with type 2 diabetes from a resource-limited setting (South Africa) participating in a nutrition education intervention

Jane Muchiri, Gerda Gericke, Paul Rheeder

Background: Adequate micronutrients intake, especially antioxidant micronutrients is important for people with diabetes due to condition-related oxidative stress. Data on micronutrient intake among South Africans with diabetes are limited.

Aim: To investigate the adequacy of dietary intake of selected micronutrients in adults with type 2 diabetes mellitus (T2DM) before and after nutrition education intervention (NEI).

Methods: Adults (40 to 70 years) with uncontrolled T2DM (HbA1c ≥8%) from two community health centres in a resource-limited setting (Moretele, North West Province) participated in a one-year randomised controlled trial. The NEI aimed to improve metabolic control through improved dietary behaviours. The intervention (n=41) and control groups (n=41) received education materials. Additionally, the intervention group participated in 8-weekly training sessions and follow-up sessions for one year. Major behaviours of NEI focus were: starchy food portion control, improvement in meal balance and vegetable and fruit intake. Three non-consecutive 24hr recalls assessed dietary intake. Estimated average requirement dietary reference intake (DRI)1 assessed adequacy. Analysis of covariance (clinic, age, gender adjustment) compared the two groups. Study had ethical approval (215/2009; Faculty of Health Sciences Ethics committee, University of Pretoria).

Results: Among the antioxidants micronutrients, vitamin C (mean) met the highest DRI (55-100%) from baseline to post-intervention, followed by vitamin E (51-66%) and selenium (< 45%). Magnesium intake was > 98% through the study, while zinc was within 100% for females and > 88% for males. Iron intake met 100% DRI for both genders. Calcium intake was below 40% through the study. No group differences were observed. Only vitamin C intake showed some improvement at 12 months.

Conclusion: Participants had sub-optimal intake of calcium and antioxidant micronutrients. Intake of magnesium, zinc and iron appeared to be adequate.

Future NEI should identify strategies for enhancing the intake of antioxidant micronutrients among people with diabetes in resource-limited settings.

Key words: Type 2 diabetes, micronutrients, adequacy, nutrition education, randomised controlled trial

42. Management of severe acute malnutrition in children (6 to 59 months) at Mokgalakwena municipality hospitals

Thabelo Rodney Mudau, Mashudu Manafe, C MacDougall

Objectives: To assess the management of severe acute malnutrition (SAM) by healthcare professionals using WHO guidelines in children 6-59 months of age and the achieved results thereof.

Methods: A descriptive design in the quantitative domain was used. A self-administered questionnaire assessed knowledge and practices of 156 healthcare professionals [18 (12%) dietitians, 24 (15%) doctors, 2 (1%) paediatricians and 112 (72%) nurses].

Results: Majority of healthcare professionals (57%) had knowledge of the guidelines for the treatment of SAM. However, on the treatment of hypoglycaemia, only 24 (16%) responded according to WHO guidelines, which is giving 10% glucose or sugar solution and feeding F75 straightaway on admission; whereas 69 (44%) reported that 10% glucose is given and 32 (21%) reported that F75 is given. Regarding micronutrient deficiencies, 109 (70%) applied the guidelines as recommended by WHO. On initiating feeding, the majority 88 (57%) applied cautious feeding correctly in SAM children. Ninety six (62%) of the healthcare professionals reported the average weight gain in children with SAM as 5g/kg/day which is poor weight gain according to WHO. Healthcare professionals with 0-5 years' working experience showed good management knowledge in all steps, while those with 16-20 years' working experience had the least appropriate knowledge.

Conclusion: Even though the results of the study showed that healthcare professionals have knowledge of most of WHO guidelines when treating SAM children, more effort is still needed to improve healthcare professionals' knowledge, skills and resources that are required to treat this group of children.

43. Anthropometric Status of Tenant Women Of Reproductive Age and Under-Five Children on Smallholder Tobacco Farms in the Northern Malawi

Justice Munthali, Gerda Gericke, Jane Muchiri

Introduction: Reviewed literature indicates that the extent of malnutrition among women and children in the smallholder tobacco farms in Malawi remains unexplored, despite them being a nutritionally vulnerable group.

Aim: To estimate the magnitude of malnutrition among women of reproductive age who are involved in the tobacco labour in smallholder farms and their under-five children by using anthropometry.

Setting: Three Extension Planning Areas, Mzimba district, northern Malawi.

Design: Quantitative cross-sectional survey.

Sample: 110 women and 139 under-five children sampled through proportional systematic random sampling. The sample size was based on 47% prevalence of malnutrition among under-five children in Malawi, estimated at 95% CI to the accuracy of 10%.

Methods: Face-to-face interviews using structured questionnaires were held with the women during the hunger season to collect demographic data. Anthropometric measurements were collected using height boards and electronic weight scales. WHO Anthro was used to compute Z-scores for anthropometric status for children based on WHO standards. BMI based on WHO cut-off points was used to assess women anthropometric status.

Ethics Approval: Natural and Agriculture Science Committee (Number EC151215-028).

Results: For women (n=110), 21% were malnourished (15% underweight, 5% overweight, 1% obese). For children weight-for-length/height (n=131), 36% were malnourished (12% severe wasted, 20% wasted, 4% overweight). For children length/height-for-age (n=131), 43% were malnourished (12% severe stunted, 31% stunted). For children weight-for-age (n=131), 46% were malnourished (12% severe underweight, 34% underweight).

Conclusion: The anthropometric status shows that undernutrition is a serious problem in the women involved in smallholder tobacco farming and their under-five children.

44. Dietary Diversity of Tenant Women of Reproductive Age and Under-Five Children on Smallholder Tobacco Farms in the Northern Malawi

Justice Munthali, Gerda Gericke, Jane Muchiri

Introduction: Limited dietary diversification ranks high among problems faced by nutritionally vulnerable populations in developing countries.

Aim: To describe dietary diversity of the women of reproductive age (15-49 years old) who are involved in the tobacco labour on smallholder farms and their under-five children (24-59 months old) by using the individual dietary diversity scale (IDDS).

Setting: Three Agricultural Extension Planning Areas, Mzimba district, northern Malawi.

Design: Quantitative cross-sectional survey.

Sample: 110 women and 88 under-five children sampled through proportional systematic random sampling.

Methods: Face-to-face interviews were held with the women during the hunger season using FAO's IDDS questionnaire. The women were asked to recall what they and their children consumed in the previous 24 hours. Nine food groups were considered and data were analysed using 2013 Microsoft excel.

Ethics Approval: Natural and Agricultural Science Committee (Number EC151215-028).

Results: The mean IDD score was low (2.5±0.8 women, 2.5±0.9 children). Majority (90% women, 89% children) consumed ≤3 food groups while 9% consumed 4-6 and none consumed ≥6. Staples were mostly consumed food group (99% women, 98% children), followed by dark-green leafy vegetables (80% women, 77% children). Consumption of legumes was low (9% women, 9% children) followed by meat (10% women, 11% children) and vitamin A fruits and vegetables (13% women, 16% children). Both the women and

children did not consume organ meat, eggs and dairy.

Conclusion: Dietary diversity is seriously low in the women involved in smallholder tobacco farming and their under-five children. Interventions to address this problem are critically needed.

45. The potential of Cereal-legume based complementary foods in eradicating undernutrition in Malawi

Timalizge Munthali, Agnes Mwangwela, Anitha Seetha, Zione Kalumikiza, Tinna Manani

Background: Undernutrition is one of the problems which Malawi as a country is facing and 5 in every 10 children are undernourished (stunted). Among other factors consumption of maize based porridge is a contributing factor to undernutrition because the porridge is low in energy and nutrient density and cannot meet the required energy, macro and micro nutrient needs of the children.

Aim: study was conducted with the aim of formulating a complementary food which has high energy and nutrient density. The study also found out the effect of maize-finger millet-pigeon pea-groundnut blend on nutritional status of children in Malawi.

Methodology: This study was a randomized controlled feeding trial where 179 children aged 6-24 months were allocated to intervention and control groups. Intervention group children ate maize-pigeon pea-finger millet-groundnuts porridge (not usual complementary food ingredients in Malawi) twice daily for 21 days. Control group children ate usual porridge twice a day for 21 days. Outcomes measured were anthropometry and nutrient content of the complementary foods from the 2 groups. Data analysis was done in SPSS version 20, WHO anthro; and Microsoft excel 2007.

Results: The present study revealed that maize-finger millet-pigeon pea-groundnut blend had higher energy content of 107kcal/100g as compared to the local complementary foods (maize porridge) which had 78.5kcal/100g. Protein was higher in maize-pigeon pea-finger millet-groundnuts blend 2.1g/100g compared to maize porridge (1.3g/100g). Fat content of grain legume based food was 3g/100g which was higher than maize porridge (1.1g/100g). Zinc and calcium content of grain legume based food was higher than maize porridge; 1.07mg/100g vs 0.65mg/100g and 83.9mg/100g vs 43.8mg/100g respectively. At the end of 21 days feeding trial, children who consumed maize-pigeon pea-finger millet-groundnut blend reduced in wasting status by 100% while in the control group, wasting reduced by 35%.

Conclusion: Study findings are essential in developing nutrition education messages that promote consumption of the maize-pigeon pea-groundnut-finger millet blend which improves nutrient intake and nutritional status among children. Future research should be conducted to find out whether maize-pigeon pea- groundnuts- finger miller blend can improve child growth.

46. Infant feeding practices of caregivers and nutritional status of children aged 3 to 24 months in Vhembe

Lindelani Fhumudzani Mushaphi, Ndivhadzo Sydney Lumadi, Zinhle Dlamini

Aim: To determine infant feeding practices of caregivers and nutritional status of infants aged 3 to 24 months in Vhembe district.

Design: Cross-sectional study design was used. Ten villages were selected using simple random sampling at Vhembe district. A total of 240 caregivers with infants aged 3 to 24 months were convenient selected. The caregivers were interviewed using the local language in their homes by the researcher. The anthropometric measurements were collected on the same day of interview. The data was analysed using SPSS, version 22 while anthropometric data was analysed using z-scores.

Results: Almost all caregivers had initiated breastfeeding while 5% exclusively breastfeed for six months. Most caregivers introduced infant formula milk, water and maize meal soft porridge before the age of three months. About half of caregivers were giving meals three times a day. The results revealed that one third of children had lowest dietary diversity, 48.3% had medium dietary diversity and 16.7% had high dietary diversity when using 24-hour recall. Less than 10% of infants were underweight, 5% were stunted while 13.3% mildly wasted.

Conclusion: Majority of mothers are still breastfeeding in most rural areas of Vhembe. However, exclusive breastfeeding for the recommended period of six months is rarely practiced. Less than 20% of infants had high dietary diversity score.

47. Tracing and Quantifying Potential Iodine Losses in Salt From Wholesale to Household Level in Rural Malawi

Misheck Mwambakulu, Alexandre Kalimbira, Getrude Mphwanthe

Introduction: Iodine deficiency remains a major public health problem in Malawi. An appropriate level of iodization depends on an accurate estimate of iodine losses occurring between production, packaging and consumption.

Aim: to trace and quantify potential losses of iodine in salt from wholesaler to consumer in Malawi.

Methodology: The study was in two phases; Phase I, a descriptive cross-sectional study conducted in rural communities of Ntchisi district. 47 salt wholesalers and retailers at Boma market, 86 rural households' were randomly selected. Phase II, an experiment was set at LUANAR food laboratory, to establish effect of local packaging materials and storage period on stability of iodine. Six packaging materials; sack, plastic bottle sealed, plastic bottle open/close, plastic blue jumbo, and basins (sun and indoor exposed basins) and original salt-packs were used to determine the stability of iodine in salt every fortnight for eight weeks. Samples were analysed using iodometric titration method at Ministry of Health central laboratory and LUANAR nutrition laboratory. Data was analyzed using SPSS (IBM, version 22) and GenStat (Version 16).

Results: 11 brands and 8 salt packaging materials were identified. Exposing salt to sun or indoor air while packed in sack, plastic bottle, plastic blue jumbo and basin for 8 weeks significantly ($p \leq 0.05$) decreased iodine levels. The percentage decrease in iodine levels was comparatively more in plastic basin; exposed to sun (42.2%) and indoor air (26.6%). The interaction of packaging and storage period significantly ($p \leq 0.05$) affected iodine stability.

Conclusion: Exposing salt to sunlight erodes huge amounts of iodine.

48. Potential of cowpea in mitigating the effects of environmental enteropathy in Malawi

Theresa Nakoma Ngoma, Agnes Mwangwela

Introduction: Cowpea, a cheap legume grown in almost all parts of Malawi contains substantial amount of zinc, crude fiber and flavonoid in addition to protein and other minerals such as iron. The nutritional profile of cowpea gives it the potential of being an intervention in mitigating the effects of environmental enteropathy, a subclinical condition which compromises intestinal ability to absorb nutrients leading to stunting in under-five children.

Aim: To process roasted, dehulled and boiled cowpea flour under hygienic conditions, evaluate the effect of processing on zinc, crude fiber and flavonoid and test the acceptability of cowpea fortified maize porridge.

Methods: Zinc and flavonoid were determined using spectrophotometric method and crude fiber was determined using the AOAC standard method. Enterobacteriacea (used as an indicator of hygiene) was determined using ISO 21528 method and acceptability testing used a 5 point hedonic scale with babies and caregivers as panellists.

Results: Zinc in the flours ranged from 4.9 to 5.8mg/100g representing a decrease from the raw cowpea content of 5.9mg/100g. Crude fiber increased with processing as flours ranged from 3.1g/100g to 4.3g/100g as compared to the raw cowpea content of 2.1g/100g. Flavonoids registered an increase with processing from the raw cowpea content of 1.2Abs g/DM to a range of 1.3Abs g/DM - 1.8Abs g/DM. The effects of processing on zinc, crude fiber and flavonoid were non-significant. All the flours had no presence of Enterobacteriacea. Maize porridge fortified with roasted, dehulled or boiled cowpea flour was acceptable with mean scores ranging from 4.03 to 4.37.

49. Use of folic acid among pregnant women with Neural Tube Defects in a hospital population

Nuzhat Nauman, Samina Jalali, Sajjad Shami, Shireen Rafiq

Introduction: The prevalence of Neural Tube Defects is high in Pakistan. Daily consumption of a supplement containing 400 ug of folic acid before and during the first trimester of pregnancy has been shown to be effective in preventing both the occurrence and recurrence of Neural Tube Defects.

Methods: For this study women with Neural tube defect pregnancy on antenatal anomaly scan or delivered a baby with Neural tube defect with no prior ante natal record were identified (n=190). Control mothers were those who had delivered a healthy baby (n=100).

Results: Dietary intake of food containing folic acid was inadequate. Women were inquired about use of folic acid supplements. None of the case mothers had heard of folic acid and were unaware of its importance in prevention of NTDs. In control mothers the percentage of women who had heard of folic acid was very low (25%) and among these only 5% took folic acid in periconceptional period. Knowledge regarding folic acid, its effect on developing embryo, and its use in prevention of NTDs is alarmingly low and could be due to low level of education and economic status of this study population.

Conclusion: The level of folic acid awareness, knowledge and use of folic acid is extremely low. Efforts including public health campaigns aimed at increasing the awareness, knowledge and periconceptional use of folic acid are urgently need both in rural and urban areas with special emphasis to less educated low socioeconomic class.

50. Factors affecting infant feeding practices at 14 weeks of age at two Mabopane clinics in Pretoria South Africa.

Cornelia Phetla

Introduction: Infant and young child feeding is critical for child health and survival (Cai et al, 2012). Infant and young child feeding practices directly affect the nutritional status of children under two years of age and ultimately impact child survival (UNICEF, 2012).The study objectives were to determine factors influencing mothers decision to exclusively breastfeed or give breast milk substitutes and to explore the barriers to exclusive breastfeeding.

Methods: The study was quantitative, cross sectional, descriptive survey. The study was conducted among the mothers / caregivers of infant of 14 weeks of age who came to the clinic for immunization and consultation. Convenience sampling was used to sample 110 mothers / caregivers. The data was collected using interview administered questionnaire. SPSS 20.0 was used to analyse data. The descriptive statistical methods were used to analyse frequencies, correlation and means. Chi-squared was used to analyse correlations between variables.

Results: The study found majority of the participants (63%) were exclusive breastfeeding, 25% were mixed feeding and 12% were giving replacement feeds. Majority (84.5 %) of the participants started breastfeeding immediately after birth. Ninety eight (98%) of the mothers think breast milk is the best option for feeding an infant. 99.1% of the participants attended ANC and 0.9% did not attend. Atleast quarter of the participants (25.5%) attended ANC classes for 6 months. Participants who attended the ANC classes for 4-9 months had breastfed exclusively. Participants who had secondary education were exclusively breastfeeding p=0.25 r=0.14 compared to those who attended for 0-3 months p=0.00 r =0.2.

Conclusion: Factors found to influence infant exclusive breastfeeding by the mother are ANC attendance, employment status, and mother's perception. Barriers of exclusive breastfeeding were work demand, lack of information, insufficient breast milk and breast conditions, thus we accept our research questions set for this study.

51. The Association between Tuberculosis and the Development of Insulin Resistance in adults wtih Pulmonary Tuberculosis

Lauren Philips, Janicke, Daan Nel, Renee Blaauw

Background: Although the existence of a bi-directional relationship between tuberculosis (TB) and Insulin Resistance (IR)/Diabetes Mellitus has been alluded to in literature, the relationship between TB as a causative factor for IR remains unclear.

Aim: This study aimed to determine whether an association existed between TB and IR in adults at baseline, as well as to document changes in IR status during TB follow-up periods.

Methods: This observational, cross-sectional study evaluated ambulatory participants at baseline for IR prevalence via anthropometry, biochemistry and diagnostic IR tests [homeostasis model assessment (HOMA-IR) and quantitative insulin sensitivity check index (QUICKI)]. Selected participants were followed-up at intervals of two and five months whilst on TB treatment. Summary statistics, correlation co-efficients and appropriate analysis of

variance were used to describe and analyse data.

Results: Fifty-nine participants were included (33.95±12.02 years old; 81.4% male). IR prevalence was 25.4% at baseline (using a calculated HOMA-IR cut-off point of 2.477). Patients with IR were shown to be younger (p=0.04). Although non-significant, a decrease was experienced between IR levels in participants between baseline and follow-up. Most participants (61.0%) presented with a normal BMI at baseline. Mean baseline values of fasting glucose were normal (4.82±0.80 mmol/L), whereas increased CRP levels (60.18±50.92 mg/L) and decreased HDL-cholesterol levels (males:0.94±0.88 mmol/L; females:1.14±0.88 mmol/L) were found.

Conclusion: This study found an association between TB and IR development. A high prevalence of IR amongst TB patients highlights the need for early identification to facilitate a reversal of IR, as well as prevent possible IR-related complications.

52. Effect of reference objects on phutu porridge portion photographs on portion size estimation by adults

Chanelle Retief, Una MacIntyre

Introduction: Food portion photographs (FPP) are useful aids for portion size estimation. There is limited information on the effect of reference objects on FPP portion size estimation.

Objective: To compare the proportions of correct estimations of phutu maize meal porridge portion sizes using FPPs showing a match box or dessert spoon with those using control FPPs.

Methods: In this experimental study, 134 adults conveniently sampled from the Pharmacy waiting area of a district hospital estimated the sizes of four pre-weighed portions (200g, 350g, 500g, 700g) of phutu maize meal porridge using FFP series which showed no reference object (control), a match box or dessert spoon. All portions, in green enamel plates, were photographed at 45°, on white background with the position of plates and reference objects constant. Participants estimated portion size by selecting one of the four FPPs. Differences between percentages of correct estimations were tested with the Chi-squared test (α=0.05).

Results: The percentage correct, over and underestimations for FPPs showing the match box were 33%, 43% and 24%; for FPPs showing the dessert spoon, 29%, 45% and 26% and for the control FPPs 37%, 31% and 32%. Neither the differences between the match box FPPs and the control FPPs (P=0.0532) nor those between the dessert spoon FPPs and control FPPs (P=0.0517) were statistically significant.

Conclusion: Addition of a match box or dessert spoon as a reference object to the FPPs of phutu porridge did not appear to have an effect on the percentage of correctly estimated portion sizes.

53. A pilot study of self-reported dietary intake and practices of staff at a South African university who perceive to have followed either a balanced, low-carbohydrate or other weight loss diet

Simone Singery, Marjanne Senekal, Mariella Dierks

Background: There is a paucity of information on the actual dietary intake and practices of dieters who perceive to be following a specific weight loss diet. The aim of this study was to investigate the dietary intake of university staff members who perceived to have followed a low-carbohydrate, typically balanced or any other weight loss diet.

Methods: Participants completed an online questionnaire to assess sociodemographic variables, current weight status, most recent weight loss method, frequency of intake of select foods during a typical week, and intake during a typical 24 hour period during the most recent weight loss attempt. Data was analysed descriptively.

Results: The majority of the sample (n=11) were female, higher socio-economic status, healthy, overweight/obese and perceived themselves as such. Mean energy intake in the low-carbohydrate group (n=4) was 8462 kJ and in the other group (n=5) was 11710 kJ), thus higher than is recommended for weight loss, while the intake of the balance group (n=2) was 4472kJ, which is in line with recommendations. The macronutrient composition of the diets was as follows (carbohydrate-protein-fat): low-carbohydrate group: 27.2%; 33.7%; 38.7%, balanced group: 49.6%; 22.3%; 27.3% and other group: 41%; 19.9%; 37.1%. The low-carbohydrate group included foods that are forbidden (The Real Meal Revolution; Noakes et al. 2013). The balanced group tended to be more likely to make poor food choices. All groups were likely to report poor adherence and discontinuation of the diet within 2-3 months. Common reasons for discontinuing the diet was disappointing weight loss and loss of motivation.

Conclusions: Individuals who perceive to be on a particular weight loss diet may meet the macro-nutrient, but not necessarily the energy and food choice requirements of a weight loss diet.

54. Food choices of mothers with children attending primary schools in the Metro North Education District of the Western Province, South Africa

Yolande Smit, Nelene Koen, Susanna Maria Kassier, Daan Nel

Introduction: Unhealthy food choices made by mothers can impact negatively on child health and may results in unhealthy eating behavior that persists into adulthood. The aim of the study was to determine the factors and barriers that influence food choices of mothers with primary school children as well as to determine the impact socio-economic status have on these factors.

Methods: A cross sectional, descriptive study with a mixed method approach. Self-administered questionnaires were used to collect data on demographics, knowledge, attitude and practices of mothers (n=476). Six focus group discussions were conducted with mothers (n=37) to investigate barriers to healthy eating.

Results: The mean nutrition knowledge score for the group was 68.6%. Nutrition knowledge was statistically significantly ($p < 0.05$) lower in the lower quintile school (64%). Mothers from the higher quintile school were more aware of the role they play in shaping a child's eating habits compared to mothers from the lower quintile school ($p < 0.05$). Mothers from the lower quintile school practiced unhealthier food preparation methods more frequently ($p < 0.05$). The main factors influencing food purchases were cost (60%), nutritional value (37%) and time constraints (29%). Barriers identified were the school environment, mixed media messages and supermarket layout.

Conclusion: Nutrition education remains priority especially among lower

socio-economic groups and should include practical advice regarding preparation of economic wholesome meals. The school-and supermarket environment as well as food industry can play a pivotal role in facilitating healthy food choices of mothers with school going children.

55. Challenges with adherence to CNCDs intervention programmes: A study in the urban Black population in Cape Town

Nasheetah Solomons, H. Salome Kruger, Thandi Puoane

Purpose: Chronic non-communicable diseases (CNCDs) have become the greatest contributor to the mortality rate worldwide. Despite attempts by Government and various non-governmental organisations to prevent and control the epidemic by different intervention strategies, the number of people with CNCDs is increasing at a rapid rate in South Africa and worldwide. The purpose of this study was to identify the target group's perceived challenges to adherence to CNCDs intervention programmes and gaps in existing CNCDs intervention strategies.

Methods: This study formed part of the Prospective Urban and Rural Epidemiological (PURE) study. The study recruited Black adults (males and females) aged 35 to 70 years. A total of 47 participants were purposely recruited for the focus group discussions from the existing PURE study cohort. Five focus group discussions were conducted. These sessions were audiotaped, transcribed and translated from isiXhosa into English. Data was analysed by the researcher and an independent person using constant comparison analysis. Codes were identified and then grouped into categories and categories were grouped into themes.

Results: All groups were aware that lifestyle modification was required in order to manage and/or prevent the development of a CNCD. The major reasons identified for non-adherence to chronic non-communicable diseases (CNCDs) health messages were being unable to afford the food prescribed, difficulty in changing lifestyle and doubting the credibility of messages relayed via media (television and radio) as well as health promotion posters. Issues such as credibility of information source, entitlement and unrealistic expectations also emerged.

Conclusion: Findings of this study clearly show that emerging issues (credibility of information source, unrealistic expectations) besides those previously identified (financial constraints, language barriers) are impacting adherence to CNCDs health messages and that ways to address these should take priority in order to stem the rising CNCDs epidemic.

56. Double burden of disease in pre-school children in Nelson Mandela Bay

Zintle Phekana, Teresa Wilson, Liana Steenkamp, Phumeza Mkontwana

Background: Malnutrition in children has been associated with inadequate early childhood development. Regular assessments are required to monitor the nutritional status and development of children in order to timeously intervene. Limited information is available regarding the nutritional status of children attending early childhood development (ECD) centres in underprivileged areas in Nelson Mandela Bay health district.

Aim: The aim of the study was to describe the nutritional status of children attending pre-schools or grade R classes in ECD centres.

Methodology: A cross-sectional study was conducted between September 2015 and February 2016 in classes from 32 pre-schools to determine the weight-for-age z-score (WAZ), height-for-age z-score (HAZ), weight-for-height z-score (WHZ) and BMI-for-age z-score (BAZ) after anthropometric measurements by trained fieldworkers using standardized equipment and techniques.

Results: The sample (n=1009) had a mean WAZ of -0.09 (SD=1.2), a mean HAZ of -0.79 (SD=1.29). The 663 children below 60 months of age had a mean WHZ of 0.59 (SD=1.28), while the remainder of the children older than 60 months of age had a mean BAZ of 0.51 (SD=1.14). Twelve percent (n=121) of the sample was stunted of which two percent (n=22) were severely stunted. Twenty to 30 percent of the sample across all age groups presented with overweight or obesity.

Conclusion: A double burden of disease was demonstrated in pre-school children attending ECD centres in Nelson Mandela Bay. Causes of these including activity patterns and dietary diversity should be investigated. Severely stunted children should be referred for targeted supplementation programmes at the nearest health facility.

57. Effect of a training intervention on the knowledge and practices of nursing staff preparing infant formula

Natalie Stuart

Introduction: Powdered infant formula (PIF) poses a microbiological hazard to the infants who consume it; both through the manufacturing process and through cross-contamination during preparation.

Aim: To investigate the effect of a training intervention on the knowledge and practices of nursing staff that prepare PIF at a district hospital (Gauteng Province).

Methods: A one-day training intervention was conducted to teach nurses about the safe use of PIF. A self-administered multiple-choice questionnaire was used to assess knowledge and a practice assessment tool was used to guide the observation of the preparation of PIF during data collection. A pre- and post-training assessment of knowledge and practices was performed in a quasi-experimental design on a convenient sample of nurses (N=33). Assessments were repeated six weeks following the training.

Results: Knowledge, pre- and post-training, was tested for statistical significance. Training resulted in significant improvement in knowledge from the pre-training test (mean score 9.39 SD 2.4; $p < 0.001$) which was retained over a period of six weeks, despite a significant deterioration seen from the post-training (mean score 16.79 SD 3.97; $p < 0.001$) to six-week test (mean score 14.28 SD 2.47; $p < 0.001$). Assessment of practices revealed poor preparation methods and only several small changes occurred after the training intervention.

Conclusions: Although training had a positive impact on increasing knowledge on the topic of formula preparation, it did not result in a satisfactory improvement of preparation practices. A strong multifaceted hands-on approach is recommended.

58. Do dietitians have a role in the prevention of atypical antipsyhotic induced metabolic syndrome?

Joerien Swanepoel

Introduction: Treatment with atypical antipsychotic drugs (AAP's) pose a significant risk to develop obesity and other related factors of the metabolic syndrome. This is due to several adverse effects of the medication.

Method: PubMed Health Library were used to search for articles on strategies to reduce the metabolic side effects of AAP drugs between 2007-2016.

Terms used: atypical antipsychotic drugs; weight gain; counselling; hyperglycaemia; lipid profile; lifestyle changes; nutrition education.

Results: 24 Peer reviewed articles found. During 2008 and 2014 most articles were published. All articles are in English. Use of weight loss drugs while on AAP treatment was recommended by 16,7% (n=4); Monitoring of weight & BMI recommended by 45,8% (n=8); Monitoring of lipid profile recommended by 37,5% (n=9); Nutrition and diet counselling recommended by 16,7% (n=4); Exercise recommended by 25% (n=6); Monitoring of glucose levels recommended by 42% (n=10); Monitoring of HbA1c recommended by 8,3% (n=2); Monitoring HOMA-IR recommended by 4,2% (n=1); Monitoring blood pressure recommended by 37,5% (n=9); Monitoring of waist circumference recommended by 25% (n=6).

Conclusion: The dietitian has an essential role in assessment, follow-up and monitoring of relevant nutritional indicators in patients on AAP treatment. Tailor-made nutrition education should be standard to all patients on AAP drugs. With a suitable protocol on baseline assessment and monitoring intervals of indicators of metabolic syndrome, the adverse effects of AAP drugs on BMI, lipid profile, waist circumference and blood glucose can be reduced.

59. Is blanket supplementation adding to disease burden?

Joerien Swanepoel, Magda Botha, Dineo Mopeli

Introduction: Institutionalization might increase the already high risk for malnutrition under elderly patients. A study in Thabo Mofutsanyana district, Free State, was done at an old age home to assess prevalence of malnutrition, contributing factors and effect of blanket supplementation with a standard feed, providing 1kcal/ml.

Materials & Method: Total of 51 residents were assessed by using BMI for mobile patients and MUAC for immobile patients. Baseline measurements and re-assessment after 41 days of daily supplementation were done. Questionnaires to assess GIT problems, eating habits and chronic diseases were used for residents that were mentally capable.

Results: Nutritional status of 24 mobile patients after first assessment reflected as follow: 4,2% (n=1) underweight; 8,3% (n=2) at risk for underweight; 33,3% (n=8) normal weight; 33,3% ((n=8) overweight; 20,8% (n=5) obese. The nutritional status after follow up of 19 patients after 41 days appeared as follow: 5,3% (n=1) underweight with average weight gain of 0,5g. 26,3% (n=5) normal weight with average weight gain of 2,3kg. 31,6% (n=6) overweight with average weight gain of 1,6kg. 31,6% (n=6) obese with an average weight gain of 2,3kg. 5,3% (n=1) morbidly obese. After first assessment of immobile patients: 36% (n=9) at risk for underweight; 20% (n=5) obese. MUAC still to be re-assessed.

Conclusion: Blanket supplementation is not recommended because weight gain occur as a result in majority of patients. The weight gain in already overweight and obese patients may increase risk for CDL's.

60. Wage War Against Malnutrition and Overnutrition

Mfundo Thango

Ladies and Gentlemen,

I greet you all, respecting your leadership roles within the food and nutrition industry, including research and educational institutions.

According to the Media Sensitization Workshop on Food and Nutrition that took place between 6-7 November 2008, as part of Millenium Development Goals in advancing the MDG's, with more than 240 million people suffering the effects of hunger and poverty in Africa.

Boitshepo "Bibi" Giyose who is the Nutrition Security Advisor for the African Union noted that :

- Malnutrition is partially irreversible
- Malnutrition is intergenerational, whilst
- Improved nutrition reduces poverty and improves:

School readiness, enrolment and retention rates including school performance among others.

Mpilo-ende Fortified Foods (Pty) Ltd, as one of the active role players in the manufacturing of nutrition based fortified foods, believes that more needs to be done to regulate the nutrition sector if we wage the war with an aim of conquering malnutrition.

There are a number of role players in the food production space, BUT we believe that malnutrition or over-nutrition as a result of the food products produced for the consumer, really has a ripple effect in terms of reversing the work that has been undertaken thus far.

The revival of the International Nutrition Alliance will serve as a policing mechanism in order to monitor and assess the honest effects and intervention of nutrition based initiatives, if we are to promote nutritional elements on all meals served, especially for Mother, Infant and Young Children Nutrition.

Lastly, we believe that all stakeholders involved including Health and Welfare Departments, Nutrition Society and other

61. Approach and methodology employed in updating the Baby foods of the SA Food Composition Database

Averalda E van Graan, Joelaine M Chetty, Malory R Links

Updating a country's food database (FDB) is essential. Key drivers warranting updates include changing consumption patterns, legislation, new food products. Baby foods were targeted, due to requests from nutrition fraternity.

Process started with desktop research, targeting key stake holders in the baby food market. Stepwise phased approach was followed to ensure best practice in attainting composition data (FCD). Contact with stake holders was established through company representatives. The aim was to determine willingness to collaborate, share product range information, more specifically nutrient data for compilation. Target dates for agreements were set. In events of non-disclosure, approaches included obtaining information brochures, label data and packaging information. Prescribed methods in handling, compiling and checking data prior to publication were followed for quality assurance.

Eight companies were contacted. Product and nutrient information of complementary foods (CF) and breastmilk substitutes (BMS) were requested from three and 4 companies respectively. In the CF category, 1 company shared data (CoA's) of 10 products; another company shared manufacturer

nutrient information (n= 10), while compilation for 97 products was done by means of obtaining label information, sourcing, matching, imputing and analyses. Company product and nutrient data for 38, 7 and 9, BMS from 3 companies were received. One company withdrew information from the DB. Update resulted in the addition of 216 new items (117 CF's; 99 BMS).

Updating the national FDB is important. Current update resulted in an increase from 51 to 267 baby food items. Data have been published on SAFOODS website and was included in the statistical DB.

62. The Quality of South African Lamb - Carcass, Nutritional and Sensory Attributes

Ina (Slomina Maria) van Heerden, Phillip Evert Srtydom

Introduction: We studied the physical composition of South African lamb carcasses across different fat classes; the sensory quality of longissimus muscle of fat code 2 lamb and the nutrient composition of the leg, shoulder and loin cuts of the same carcasses.

Materials and Method: The carcass sides of 64 grain fed lambs representing various fat levels were subdivided into seven wholesale cuts that were dissected into meat, bone and subcutaneous fat to determine the physical composition per cut. Three cuts from the right sides of Dorper and Merino lamb carcasses, representing three main production areas in South Africa were used for the sensory analysis. The shoulder, loin and leg cuts from the left sides were used to determine the cooked nutrient composition. Using GenStat for Windows, 2000, the significance of all variables measured for each sample was tested by means of factorial analysis of variance.

Results: The % subcutaneous carcass fat increased significantly from 3.8% to 18.4% between fat scores 1 and 5. Carcass fatness had no effect on tenderness and flavour, while scores for juiciness increased over fat class of loin cuts. The fat content of cooked shoulder was higher than that of cooked loin and leg, while loin cuts had higher sodium and potassium levels than the other two cuts.

Conclusion: The South African classification system effectively describes variation in fat content and therefore product yield of lamb. Increased fatness affects perception of juiciness probably due to release of fat during chewing.

Keywords: South African lamb, carcass, nutrition, sensory

63. Probiotics Feeding Tolerance and Growth in HIV-Exposure

Evette van Niekerk, Gert Kirsten, Reneé Blaauw

Objective: To compare the effect of administration of probiotics on feeding tolerance and growth outcomes of HIV-exposed (but uninfected) versus HIV non-exposed preterm infants. The null-hypothesis of this study states that there will be no difference in the feeding tolerance and growth outcomes for both probiotic exposed and unexposed premature very-low birth weight infants.

Patients and Methods: A randomized, double blind, placebo controlled trial was conducted for the period July 2011 to August 2012. HIV-exposed and HIV-unexposed premature (< 34 weeks gestation) infants with a birth weight of ≥500g and ≤1250g were randomized to receive either a probiotic mixture or placebo. The multispecies probiotic mixture consisted of 1x109 CFU, L. rhamnosus GG and B. infantis per day and was administered for 28 days. Anthropometrical parameters, daily intakes and feeding tolerance were monitored.

Results: 74 HIV-exposed and 110 HIV-unexposed infants were enrolled and randomized (mean birth-weight: 987g ±160g, range: 560g-1244g); mean gestational age 28.7 weeks). A total of 4 227 probiotic doses were administered (mean 22.9 /infant). There was no difference in the average daily weight gain for treatment groups or HIV exposure. The HIV-exposed group achieved significantly higher z-scores for length and head circumference at day 28 than the unexposed group ($p < 0.01$ and $p=0.03$, respectively). There were no differences in the incidence of any signs of feeding intolerance and abdominal distension between the groups.

Conclusion: Probiotic supplementation did not affect growth outcomes or the incidence of any signs of feeding intolerance in HIV-exposure.

Financial Disclosure: The authors have no financial relationships relevant to this article to disclose.

64. Glycaemic Index of potatoes: A South African case study

Carmen van Niekerk, Hettie Schönfeldt, Nicolette Hall, Beulah Pretorius

Introduction: Carbohydrates should comprise between 45%-65% of total dietary energy, it provides a mixture of nutrients and other elements that may have a synergistic effect on human health. Potatoes are a diverse species and have a unique carbohydrate structure and contribute to total consumption of minimally processed starchy foods. Although a vegetable, this tuber is seen as one of the starchy staple foods of the South African population which has an effect on raising glucose levels in the human body. However, it has been reported that different cultivars as well as different cooking methods and serving temperatures have different effects on a foods glycaemic index (GI).

Aim: Determine the GI values of potato tubers from different laboratories consumed warm and cold compared to international data.

Methodology: Firstly nutrient analysis on selected nutrients was done. Secondly the GI of Almera potatoes were determined at two laboratories performing two trials each. All GI analysis, methods and calculations were performed according to ISO 26642. Potatoes were consumed hot and cold to determine the effect that heating and cooling potatoes will have on the GI values. Thirdly these values were compared with common values used locally and internationally.

Results: Potatoes are generally considered high GI (70 >) and the mean GI for the Almera cultivar was 71.5, falling into this range. But, two of the trials showed potatoes to fall into the intermediate GI class (56-69). Statistically significant differences were found between the GI values obtained from the different laboratories.

65. Influence of a non-traditional high temperature short time (HTST) treatment on the protein quality of a ready-to-eat sorghum-cowpea African porridge for young child-feeding

Nokuthula Vilakati, Andre Oelofse, Una MacIntyre, John Taylor

Introduction: Protein is one of the most prevalent nutritional deficiencies in developing countries. Even though indigenous plant foods play a major

nutritional and cultural role in Africa, they can contain high levels of antinutrients, which may exacerbate nutritional problems among young children consuming a nutrient deficient diet.

Materials and Aim: A ready-to-eat (RTE) composite meal suitable for young children aged two to five years was formulated using extrusion cooked decorticated sorghum (ES) and micronised (infrared treatment) dehulled cowpea (MC) to make an ESMC RTE meal. The ESMC RTE meal was supplemented with a cooked cowpea leaf relish. Effects of the high temperature short time (HTST) (extrusion cooking and micronisation) heat treatments, compositing and adding a cooked cowpea leaf relish on the protein content; trypsin inhibitor activity (TIA), total phenolic content (TPC) and tannins were investigated. The effects of HTST heat treatment, compositing and adding the relish on protein quality, in vitro protein digestibility (IVPD) and bioaccessibility were also invstigated. Protein quality was assessed using the calculated Protein Digestibility Corrected Amino Acid Score (PDCAAS), pepsin and multienzyme IVPD assays.

Conclusion: Micronisation inactivated TIA. A daily serving of the recommended portion size of the ESMC RTE meal with the leaf relish would meet approximately 40% of the protein and lysine requirements for children two to five years. The high tannin content in the leaf relish did not negatively affect the PDCAAS. ESMC RTE meal with the leaf relish can provide protein nutrition for young children, increase diversity and food security in Africa.

66. An Evaluation of Nutrition Care to Adult Patients on Highly Active Antiretroviral Therapy (HAART) Attending Primary Healthcare Facilities in Mbombela North, Mpumalanga

Janicke Visser, Jane Schiever, Maria van der Merwe

Introduction: This study aimed to evaluate the nutrition care received by adult patients on HAART attending primary healthcare (PHC) facilities in Mbombela sub-district (Ehlanzeni district), Mpumalanga.

Methods: This cross-sectional descriptive study included 263 adult patients on HAART (interviewer-administered questionnaire; pre-defined anthropometric measurements) and 75 nursing professionals (self-administered questionnaire). Nineteen PHC facilities were assessed.

Results: A total of 41.4% of patients were overweight or obese, and most (51.8%) females had a body mass index (BMI) ≥ 25. Females had a significantly higher mean BMI (26.2 ± SD 5.71) than males (22.8 ± SD 3.32) ($p < 0.05$). Based on waist circumference, 52.7% of females and 8.4% of males were at increased risk of cardiovascular disease. Although nurses were aware of a nutrition supplementation programme, knowledge of the national nutrition supplementation programme guideline (NNSPG) details was inadequate. Clinical judgement, rather than eligibility criteria, was used to identify patients eligible for supplementation, with 13.3% of patients receiving nutrition supplementation, whilst only 4.9% qualified for supplementation. Most patients (70.7%) had a previous weight recorded on file, while only 6.1% had height and 4.6% had BMI records available. Stock shortages of nutrition supplements in PHC facilities posed a major problem.

Conclusion: Nutrition counselling should be guided by recognised guidelines and focus on preventing over-nutrition and associated disease. Nurses should be familiarised with the NNSPG through formal training and have a reliable nutrition supplement supply. The supplementation programme could be reviewed to better meet the needs of the majority of patients who are not undernourished, but who are food insecure.

67. Which nutrients to include in a Nutrient Rich Foods profiling model to score snack foods eaten by children?

Marina Visser, Tertia van Zyl, Mieke Faber

Background: Nutrient profiling can be used to determine the nutrient quality of snacks, focusing on nutrients to encourage and nutrients to limit. Snacks of high nutrient quality can contribute to the improvement of nutritional status of children.

Aim: To describe trends in the nutritional status of South African children and adolescents and to determine which nutrients to include in a nutrient profiling model, and which snacks are mostly consumed.

Methods: National nutritional surveys conducted from 1999 to 2012 were used as the principal data source for determining targeted nutrients to include in the profiling model. The information of the snacks consumption was collected from single studies.

Results: Since 1999 there has been a decrease in the prevalence of underweight, stunting and wasting in South African children younger than 14 years of age. In adolescents there was a decrease in underweight, while stunting and wasting increased to some extent. The rates of overweight and obesity increased in all age groups.

Fourteen nutrients and minerals to encourage were identified, including protein, vitamin A, iron and zinc; and three nutrients to limit: saturated fat, added sugar, and sodium.

The results of the snacks consumption showed that mostly eaten are the savoury snacks, sweets, chocolates and biscuits.

Conclusion: The consumption of snacks energy-rich and nutrient-poor may contribute to a high prevalence of stunting, overweight and obesity. Nutrient profiling model based on 14 nutrients to encourage and 3 nutrients to limit may assist in identifying healthy snack foods.

Key words: Snacks, nutrient profiling

68. The Ability of Adolescents (Aged 13-19) to Estimate Amorphous Food Portions from Food Photographs using Bean Bags

Friede Wenhold, Shani Cohen, Maxine De Araujo, Deidre Huysamen, Genna-Lee Uren

Background and Aim: There is a lack of validated, accessible and affordable portion size estimation aids for adolescents. We thus aimed to determine the ability of middle and high school learners to match food photographs of known volumes of amorphous foods to corresponding bean bags.

Methods: Learners of a private, co-educational school were shown 20 photographs of 11 different amorphous, dished-up foods of known, but varying portion sizes, and requested to match each photograph with one of six bean bags (volume range of food portions and of bean bags ¼ to 2½ cups). Three different food portion sizes were test-retested. Descriptive statistics summarised the data by school phase, gender, portion size, food type and frequency of consumption.

Results: 51 learners (13-19 years; grade 7-12; high school: n=26 [51%];

male: n=32 [62.7%]; response rate: 88.5%) participated. Test-retest reliability was acceptable. The majority of learners estimated 90-95% of food photographs perfectly or acceptably. High school participants had a 5% higher perfect to acceptable score rate than middle school participants. Males had a 10% higher perfect to acceptable score rate than females. Food portions of ¼ cup and 1 cup were more often correctly estimated than other portion sizes. Meat dishes (minced meat and chicken curry) were underestimated by most participants. No association between consumption frequency and estimation accuracy was noted.

Conclusion: Adolescents showed the ability to identify amorphous food portions using bean bags in a manner that is acceptable to perfect, thereby paving the way for follow-up validations.

69. The Accuracy of Bean Bags as Portion Size Estimation Aids for Different Food Types Among Elderly

Friede Wenhold, Heidi Schröder, Claudia Martin, Astrid Schröder, Sally McMillan, Michelle Hawksworth

Background and Aim: The elderly population is increasing globally, yet little research has investigated which aids can help the elderly estimate food portion sizes of different food types. The study aimed to examine the accuracy of bean bags as portion size estimation aids for four food types (amorphous masses, amorphous pieces, solids and liquids) among elderly residents from an old age home/retirement village.

Methods: Convenience sampling was performed. Two familiar menu items for each food type were separately plated (each food ¾ cup) and randomly presented in three fixed combinations to participants in a standardised, individual, interviewer-led administration. Participants were requested to match each food quantity to one of six, coded bean bags (¼, ½, ¾, 1, 1½ and 2 cup). Estimation accuracy was described through comparing percentage agreement across food types. Acceptable accuracy was defined as perfect agreement plus under- or overestimation by ¼ cup.

Results: Thirty seniors (87% female; age 80±7.4 years) participated. Perfect agreement was found for 21.7%, 21.7%, 30.0% and 36.7% of participants for amorphous masses (porridge/scrambled eggs), solids (whole apple/bread), liquids (fruit juice/tea) and amorphous pieces (diced apple/grapes) respectively. Acceptable accuracy was achieved for 73.3%, 76.6%, 80.0% and 81.7% of participants for amorphous masses, liquids, solids and amorphous pieces respectively.

Conclusion: Bean bags did not result in perfect quantification of a ¾ cup of foods of different types, with relatively little difference across food types. Degree of accuracy needed determines usefulness of bean bags for estimating portion sizes among elderly.

70. Assessment of the physical quality and whipping volume of supermarket eggs in Pietermaritzburg, South Africa

Nicola Wiles, Nicola Tyler

Introduction: A variety of eggs are available for consumers to purchase including barn eggs, farm eggs, grain fed, free range and organic eggs.

Aim: To determine differences in the physical quality of the components and whipping volume of various supermarket eggs in Pietermaritzburg.

Methods: Fifteen brands of one dozen large eggs were purchased on the same day from the front of the shelf of eight supermarkets. Eggs were analysed within three days to determine egg weight, height and diameter; yolk weight and colour; dried shell weight and thickness; albumen weight, height (Haugh unit), pH and whipping volume.

Results: Significant differences ($p < 0.001$) were observed in relative yolk and albumen weights when comparing the various production systems (barn, free range or cage). Barn eggs had a lower relative yolk weight (13.26g) and higher relative albumen weight (37.31g) and cage eggs had the highest relative yolk weight (16.26g) and lowest relative albumen weight (35.66g). Albumen quality differed significantly, where barn eggs had a significantly higher mean Haugh unit (78.77) compared to both free range (63.76) and cage eggs (48.07), although free range eggs had a significantly higher mean Haugh unit than cage eggs. No differences were observed in albumen pH or whipping volume. Yolk colour score was significantly higher in free range eggs (8.33) although cage eggs had a significantly higher yolk colour score than barn eggs (7.59 vs 5.83).

Conclusion: There were significant differences in most measures of egg quality between the various brands.

Keywords: Egg quality, egg components, whipping volume

71. An examination of the current controversies regarding the benefits of marine omega fatty acid consumption for heart and brain health

Robert Winwood

EPA and DHA beneficially modify a broad range of cardiovascular disease risk factors, including blood triglycerides, blood pressure, platelet function, heart rate variability and inflammatory markers. The practical results of this include improved blood flow and reduced build up of atherosclerotic plaques. A systematic review of 14 major studies carried out in 2005 demonstrated that cardiac mortality could be reduced by around a third following intervention with marine omega 3 fatty acids .

However, a number of clinical trial conducted using omega 3 fatty acid interventions with cohorts at risk of progressive cardiovascular disease since 2010 have failed to show the promise of earlier trials. This paper will examine the relevant studies (and meta-analysis) in an attempt to explain this phenomenon.

DHA is an important structural component of the brain and central nervous system. It is naturally present in all human breast milk and is added to most infant formula because of the convincing evidence that it is required to facilitate optimum visual acuity. Some trials have also suggested that supplementation can improve the intelligence of infants and children, but others have failed to do so. A major problem in comparing data from clinical trials has been the differences in the methodologies for assessing intelligence and cognitive development.

A review will be made regarding the use of marine omega 3 supplementation in older people presenting with early stages of cognitive decline. Here, there is encouraging evidence that intervention can help restore memory and reduce the risk of the onset of dementia.

72. The effect of a tailored nutrition education programme on food choice intentions of grade one learners in resource limited settings of Pretoria

Chido Zambuko, Gerda Gericke, Jane Muchiri
Department of Human Nutrition, Faculty of Health Sciences, University of Pretoria, South Africa

Background: School based nutrition education programs (NEP) play a critical role in promoting positive dietary change in children. Behaviour intentions are associated with actual behaviour.

Aim: To determine whether nutrition education based on South African food based dietary guidelines will improve the food choice intentions of grade one learners in resource limited settings of Pretoria.

Study design: Quasi experimental without control group

Method: A NEP planned based on an analysis of learners' dietary behaviours (behaviours reported by parents) was conducted with conveniently selected grade one learners (n=83) from two schools. All participants received nine lessons for six weeks. A modified validated Pathways knowledge, attitudes and behaviours questionnaire assessed food choice intentions at baseline and at six weeks. Paired t-tests evaluated the effect of the NEP. McNemar test compared frequencies for specific food choice intentions.

Results: 76 participants completed the study. From baseline to post intervention, the mean scores for overall healthy food choice intentions (M=0.41974 vs. M=0.5671; $p < 0.0001$) and healthy snacks intentions (M=0.475 vs. M=0.59; $p < 0.05$) significantly increased. The proportion of learners intending to choose healthier take away foods increased significantly (22.4% vs. 53.9%; $p < 0.05$) while those intending to choose healthy breakfast increased from 46.1% to 50% (not significant). Those with intentions to choose healthier drinks decreased (38.2% to 36.8%; $p > 0.05$).

Conclusion: Tailored NEP can improve food choice intentions of grade one learners in resource limited settings. Further studies using randomisation as well as assessing actual dietary behaviours are needed.