Association between Mediterranean diet adherence and mental health

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were allocated to the intervention or usual foodservice system for their length of stay (LOS) in a parallel controlled pilot study. BMI, hand grip strength (HGS), food intake and satisfaction with the foodservice were measured. Change in BMI and HGS (admission to day 14 or prior if discharge was earlier) and satisfaction were compared using χ^2, Mann Whitney U test or *t*-test.
Results: Data were available for 117 participants ($n = 59$ control, $n = 58$ intervention). The median LOS was 20 days, age was 83 years and prevalence of malnutrition was 38%. The mean changes in BMI (-0.1 ± 0.8 kg/m^2 vs. 0.1 ± 0.7 kg/m^2, $p = 0.343$) and HGS (2.4 ± 5.4 kg vs. 1.4 ± 5.7 kg, $p = 0.383$) and median scores for satisfaction (food quality 1.9 vs. 1.9, $p = 0.486$; meal service 1.7 vs. 1.7, $p = 0.805$; staff 1.0 vs. 1.0, $p = 0.877$; environment 1.0 vs. 1.0, $p = 0.137$) were not different between intervention and control groups, respectively.
Conclusions: At day 14 there was no improvement in anthropometry, but no dissatisfaction with the enhanced foodservice system. Further analyses of longitudinal and food intake data are required to fully evaluate the effects of this intervention.
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DAIRY INTAKE EFFECTS ON BONE AND MUSCLE STRUCTURE IN OLDER COMMUNITY-DWELLING WOMEN

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Background/Aims: We have shown that fractures are predicted by reduced bone and neuromuscular structure and function; however data on the role of dairy intake in improving the structure of these systems is limited.
Methods: Elderly women ($n = 564$; mean age 84.7 years) in the CAIFOS/CARES cohort completed a validated food frequency questionnaire including milk, yogurt, and cheese consumption. whole body appendicular skeletal and muscle mass were assessed by dual x-ray absorptiometry (DXA) and tibial bone mass, volume and volumetric bone density (vBMD) by peripheral quantitative computed tomography (pQCT). Women were categorized according to tertiles of dairy intake in low (< 1.5 servings/day), intermediate (1.5 to 2.2) and high (>2 .2 servings/day).
Results: Controlling for confounding factors, DXA assessment showed that compared with the higher tertiles, women in the low tertile had a 6.7% lower appendicular bone mass associated with a 3% lower bone area and thus no effect on appendicular BMD. pQCT total bone mass in the low tertile women compared to the higher tertile women were 5.2% lower principally because of a 6.2% decrease in cortical and subcortical bone mass, trabecular bone mass was not different. Further analysis suggested that low dairy calcium and protein accounted for the bone effects. DXA skeletal muscle mass was 3.8% lower not related to total dairy protein.
Conclusions: These data are consistent with a beneficial threshold effect of ≥ 1.5 serves of dairy/day. The mechanism of the muscle effect remains uncertain; bone effects involve both dairy calcium and protein.
Funding source(s): NHMRC, Dairy Health and Nutrition Consortium.

THE AUSTRALIAN PARADOX IS CONFIRMED: UPDATED EVIDENCE THAT REFINED SUGARS INTAKE IS DECLINING

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Background/Aims: The specific role of refined sugars in the obesity epidemic is contentious. Up to 2009, different lines of evidence indicated a steady decline in refined sugar consumption by Australians since 1980.
Methods: In the present analysis, we updated our previous systematic literature review to include papers published between 2009 and 2014 and incorporated publications and data issued by government, academia and industry.
Results: The recent Australian National Nutrition Survey indicated a 9.5% decrease in the absolute intake of total sugars (added + naturally occurring) between 1995 to 2011, and a 3.5% decrease in the percentage of energy derived from total sugars. Added sugar from soft drinks, flavoured waters, energy and electrolyte drinks decreased from 14.4 g/day to 13.5 g/ day, although energy remained the same (2.5% of total energy). Using ABS methodology, Green Pool Commodity Specialists updated the original Australian Bureau of Statistics data series (including the sugar in imported processed food), showing that refined sugar consumption per capita fell 16%, from 50 kg/head in 1970 to 42 kg/head in 2011. Within this period, intake fell as low as 38 kg/head in 1998 but rose to 46 kg/head in 2004 before falling again. National grocery sales data showed that the refined sugar contribution from water-based beverages fell 17%, from 9.2 to 7.6 kg per person between 1995 and 2011.
Conclusions: Three independent datasets therefore confirm a decline in the intake of total sugars, refined sugars, and added sugars contributed by sugar-sweetened beverages, by the average Australian.
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FISH INTAKE DURING PREGNANCY AND FOETAL NEURODEVELOPMENT – A SYSTEMATIC REVIEW OF THE EVIDENCE

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Background/Aims: Australian women are not meeting recommended intakes for fish. Fish are a source of several nutrients important for healthy foetal development. Fish are also a potential source of contaminants including methyl-mercury; therefore, risks and benefits from fish consumption need to be considered when shaping public health messages for pregnant women. A systematic literature review critically evaluated whether fish intake during pregnancy was associated with offspring neurodevelopmental outcomes.
Methods: Peer-reviewed journal articles published between January 2000 and April 2014 were sourced from Medline, Scopus, Web of Science, Science Direct and the Cochrane Library. Eligible studies included those of healthy pregnant women with full term births, measured fish or seafood intake and assessed neurodevelopmental outcomes in offspring.
Results: Of 474 papers sourced, eight observational cohort studies were included in the final review. Due to heterogeneity in methodology and measured outcomes, a qualitative comparison was conducted. A relationship was found between consumption of 1-4 serves of fish/week and improved neurodevelopmental outcomes in offspring aged between 6 months and 9 years.
Conclusions: Moderate consumption of fish during pregnancy has benefits on neurocognitive outcomes in infants and young children. This evidence supports promotion of dietary messages to encourage fish consumption during pregnancy. These messages, however, need to be provided within the context of food safety guidelines and avoidance of methyl-mercury contamination.
Funding source(s): N/A.

ASSOCIATION BETWEEN MEDITERRANEAN DIET ADHERENCE AND MENTAL HEALTH

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Background/Aims: Depression is a leading cause of disability-adjusted life years, and is predicted to be a top contributor to global burdens of disease by 2030. Emerging evidence suggests that a Mediterranean style diet may be beneficial for improving depression and mental health. The aim of this study was to investigate associations between Mediterranean diet adherence, mental health and quality of life in individuals with depression.
Methods: This study utilised baseline data for 82 adults aged 18-65 years with depression, recruited for a Mediterranean diet intervention. Mediterranean diet adherence was measured using a 14-item questionnaire. Mental health and quality of life were assessed using the Depression Anxiety Stress Scales (DASS), Positive and Negative Affect Scale (PANAS), and Adolescent Quality of Life (AQoL) questionnaire (8D-version).

Differences in mental health and quality of life for Mediterranean diet adherence were tested using one-way ANOVA.
Results: Adherence to Mediterranean diet was low, with no participants having a high adherence, 29.6% moderate adherence, and 70.4% low adherence. Lower Mediterranean diet adherence was significantly associated with higher depression (8.08 vs. 12.09, $p = 0.042$) and anxiety scores (4.92 vs. 8.31, $p = 0.014$). Conversely, higher scores on the AQoL Happiness (50.78 vs. 34.94, $p = 0.006$), Coping (52.43 vs. 39.40, $p = 0.020$) and Mental Health scales (60.60 vs. 48.48, $p = 0.005$) were significantly associated with higher Mediterranean diet adherence.
Conclusions: This study found that low adherence to a Mediterranean diet was associated with poorer mental health outcomes. This proposes a target for dietary intervention to improve mental health. We are conducting a randomised controlled trial to investigate this.
Funding source(s): NHMRC.

VITAMIN D STATUS AND ENDOTHELIAL FUNCTION: AN UPDATE OF RANDOMISED CONTROLLED TRIALS

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Background: Poor vitamin D status has been implicated in obesity and other chronic diseases. Endothelial dysfunction may underscore insulin resistance and hence predispose to both CVD and T2DM. Our objective was to gain an appreciation of the recent causative evidence linking vitamin D and endothelial function.
Methods: We searched the PubMed database from 2009 to date. Key words used were vitamin D, supplementation, systemic inflammation, endothelium, endothelial dysfunction and humans. Selected articles were restricted to the English language and to RCTs of vitamin D supplementation with direct measures of endothelial function. Final inclusion was based on a quality rating ≥ 3, based on the Jadad score.
Results: Ten RCTs met these criteria and were summarized for their outcomes. Only two studies showed an improvement in flow mediated dilatation with vitamin D. Three other studies reported decreases in C-reactive protein, platelet activation inhibitor-1, tissue plasminogen activator and B type natriuretic peptide. There was a range in methodology, final vitamin D status values achieved and duration of change in vitamin D status. There were no consistent effects across the studies.
Conclusions: Recent evidence from good quality RCTs did not support a beneficial effect of vitamin D on vascular reactivity.
Funding source(s): School of Public Health, Curtin University.

EFFECT OF MATERNAL DIET ON OFFSPRING METABOLIC PROGRAMMING: CHANGES INDUCED BY CARBOHYDRATE QUALITY

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Background/Aims: Maternal diet and gestational diabetes have important implications for offspring health and disease. We compared glucose metabolism and mRNA expression of the *FTO*, leptin and other appetite-regulating genes in hypothalamic, adipose and other tissues of offspring of female mice fed high vs. low glycaemic index (GI) starch diets throughout pregnancy.
Methods: Female C57BL/6 mice were randomly assigned to a low GI, high GI diet, or standard chow from 4 weeks of age and then mated with males fed standard chow. Male pups ($n = 40$) were weaned at the end of postnatal week 4 and divide into 2 subgroups, one following the chow diet and one their mother's diet until 20 weeks of age (i.e. early life and life-long exposure respectively). Differences were compared by one-way ANOVA.
Results: *FTO* gene expression in the hypothalamus of offspring fed high GI starch from conception to postnatal week 20 was 2.5-fold higher than those fed low GI starch for the same time period ($p = 0.01$). Similarly, placental *FTO* gene expression was 3.8-fold higher in mothers fed the high GI starch diet vs. the low GI diet ($p = 0.0003$). The co-expression of hypothalamic appetite genes *AGRP/NPY* and *POMC/CART* was also differentially regulated by the nature of the dietary carbohydrates.
Conclusions: This study suggests that carbohydrate quality, specifically the GI and/or rate of starch digestion in maternal diets, can differentially regulate the expression of the *FTO*, leptin and appetite-related genes in offspring tissues even in the absence of phenotypic differences.
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EFFECT OF RED MEAT AND DAIRY ON INSULIN SENSITIVITY

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Background/Aims: Epidemiological evidence suggests that higher consumption of dairy may improve insulin sensitivity and higher consumption of red meat reduces sensitivity but the evidence is mixed. The aim is to investigate the effect on insulin sensitivity from three weight-stable diets; high red meat, no dairy; high dairy, no red meat; and no red meat or dairy.
Methods: Eighteen men and 29 women (mean ± SD age 47.8 ± 13.0 years, BMI 31.1 ± 5.1 kg/m^2) completed the study. Twenty seven participants had normal glucose tolerance, 20 had impaired fasting glucose (IFG) or impaired glucose tolerance (IGT). A 75 g OGTT was conducted at the end of each diet for measurement of glucose, insulin and C-peptide. Difference between groups was tested using repeated measures ANOVA and paired samples *t*-tests. Insulin sensitivity was assessed by homeostasis model of assessment (HOMA-IR) and the methods of Stumvoll and Matsuda, using either fasting insulin and glucose levels or 3-5 insulin and glucose values over 2 hours.
Results: Fasting insulin was higher in the dairy diet vs the red meat diet (6.6 ± 4.1 mU/L vs. 5.5 ± 2.4 mU/L respectively, $p = 0.008$), with no difference in fasting glucose, resulting in an increase in insulin resistance as assessed by HOMA-IR ($p < 0.05$). No difference in insulin sensitivity between diets was found with the OGTT, as measured by the methods of Stumvoll and Matsuda.
Conclusions: Consumption of dairy appears to reduce HOMA-assessed insulin sensitivity but these results need to be interpreted with caution as the more dynamic tests for insulin sensitivity using OGTT were not different between diets.
Funding source(s): NHMRC.

EFFECTS OF WEIGHT LOSS WITH A VERY LOW CARBOHYDRATE, LOW SATURATED FAT DIET ON ENDOTHELIAL FUNCTION IN PATIENTS WITH T2DM

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Background/Aims: Very-low carbohydrate, high fat diets are a popular weight loss strategy. However, compared to a traditional high-carbohydrate low fat (HC) diet, these diets have been associated with impaired effects on endothelial function that could be due to their high saturated fat content. This study aimed to examine the effects of a hypocaloric very low carbohydrate, low saturated fat (LC) diet compared to an isocaloric HC diet, after 12-months, on brachial artery flow mediated dilatation (FMD; a measure of endothelial function) in patients with T2DM.
Methods: Obese patients with T2DM ($n = 115$; mean ± SD age 58.4 ± 7.1 years, BMI 34.6 ± 4.3 kg/m^2, HbA1c 7.3 ± 1.1%) were randomised to consume either a moderately energy restricted LC diet (carbohydrate:proetein:fat:saturated-fat 14:28:58:<10; $n = 58$) or an isocaloric HC diet (53:17:30:<10; $n = 57$) whilst undertaking supervised exercise classes (60 mins, 3×/week). Body weight and FMD were assessed before and after 6 and 12-months using mixed models analysis.
Results: Seventy two participants completed the intervention (LC = 40, HC = 32). Both groups experienced similar substantial weight reduction after 6 months (-11.8 ± 6.5 kg), followed by a small weight-regain from 6-12 months (1.9 ± 3.5 kg; $p < 0.001$) with no differential diet effects ($p = 0.99$). FMD did not change significantly in either diet group ($p = 0.054$ time, $p = 0.42$ time × group).