Background/Aims: Theanine (L-THE) is a non-proteinaceous amino acid predominately found in green tea that has been associated with a number of health benefits including improvements in mood, cognition and reduction of anxiety-like symptoms. However, the majority of these studies have been performed in animal models of psychological stress while human trials are relatively scarce. The main aim of this study was to review the current literature on the effect of L-THE intake, in the form of nutritional supplements, on stress and anxiety levels in humans.

Methods: The systematic review was conducted following the preferred reporting items for systematic reviews and meta-analyses (PRISMA) guidelines on four major electronic databases (PubMed, Cochrane Library, Scopus and Web of Science). Only L-THE supplement studies that were published in peer-review journals in English, and conducted on humans in randomised controlled trials (RCTs) were included.

Results: Five RCTs with L-THE (200-400 mg/day; up to 8 weeks) in a total of 104 (M = 77; F = 27) participants met the inclusion criteria. Four studies included participants who had no pre-existing mental illnesses and one study used participants with existing mental conditions. All studies were placebo-controlled but one study also compared L-THE against a commonly used anti-anxiety pharmaceutical (alprazolam). The findings in four studies indicated significant improvements in reducing stress and anxiety (p < 0.05). However, the results of the study comparing the L-THE and alprazolam did not show a significant anxiolytic effects with either treatments.

Conclusions: L-THE supplementation can assist in reducing acute stress and anxiety in people experiencing stressful situations.

Funding source(s): N/A.

THE COMPOSITION OF BREAKFAST AND ITS EFFECTS OF COGNITIVE AND ACADEMIC PERFORMANCE OF ELEMENTARY AND SECONDARY SCHOOL STUDENTS

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Background/Aims: Breakfast is known as the most important meal of the day with multiple benefits, including both mental and physical. Determinants of breakfast include sociodemographic characteristics, weight concerns and feeling rushed in the morning. This study aimed to conduct a systematic literature review to describe the types of micronutrients and macronutrients consumed for breakfast, and identify the effects of cognitive and academic performance of elementary and secondary school students.

Methods: A database search was conducted using Scopus and Science Direct. The search terms included, breakfast, composition, quality, cognitive, academic performance, children, adolescent. Publications were limited 2005-2015.

Results: Fifteen relevant articles were included. Studies shows breakfast has a significant effect on cognitive and academic performance on children and adolescents with some benefits of increased memory, attention span in class and IQ. Carbohydrates were shown to be good source to fuel physical and mental functions. A low glyvemic index breakfast was further found to increase attention and memory allowing students to remain on task during class.

Conclusions: Breakfast has significant effects on cognitive and academic function allowing for a longer concentration span and increased memory with class tasks amongst school children. Specific testing of macronutrients and micronutrients, extending the type of meal throughout the day to measure the types of effects that other meals have on cognitive and academic performance is an important consideration.

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A SYSTEMATIC INVESTIGATION INTO VALIDATING A SOURCE DATA VERIFICATION METHOD TO IMPROVE DATA QUALITY IN CLINICAL RESEARCH

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Background/Aims: Clinical trial guidelines are non-specific concerning the recommended frequency, timing and nature of data audits. Source data verification (SDV) is the process of comparing data collected on original documents to case report forms or electronic records. Absence of a well-defined data quality definition and method to measure error undermines the reliability of data quality assessment methods. The aim of this review was to examine previous SDV auditing methods to monitor data quality in a clinical research setting.

Methods: Using MEDLINE, Scopus and Science Direct databases, a systematic literature review of published studies was conducted. Studies were included if they implemented a SDV auditing method and excluded if not available in full-text or English language.

Results: 802 studies were identified and 15 scrutinized. The nature and extent of SDV audit methods varied, depending upon the complexity of the source document, type of study, variables (primary or secondary), amount (2-100%) and frequency (1-24 months) of data collected. Methods implemented to code, classify and calculate error were inconsistent. The main source of error was from transcription errors and experience of data entry personnel. Repeated SDV audits on the same dataset demonstrated improvement over time.

Conclusions: Recommendations in the literature are inconsistent and no method of SDV can be determined as the “gold standard”. Significant variations in procedures, policies, requirements and technologies of audit designs were identified. Clinical trials should employ a method including random samples (~10%), critical and non-critical variables and multiple audits with quality improvement feedback.

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DIETARY INTERVENTION REDUCES MARKERS OF NEUTROPHIL ACTIVITY IN OBESE ADULTS WITH ASTHMA IN A FOURTEEN WEEK RCT

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Background/Aims: Overweight and obesity is prevalent in adults with asthma and associated with neutrophilic airway inflammation and oxidative stress. The effect of dietary carotenoids in overweight/obese adults with asthma is unknown. We aimed to: (1) compare airway neutrophil markers, systemic inflammation and carotenoid levels in healthy-weight versus overweight/obese adults with asthma; and (2) examine the effects of a high, versus low, fruit and vegetable diet on these markers in overweight/obese asthmatic adults.

Methods: In a cross-sectional analysis, sputum neutrophil elastase activity, toll-like receptor (TLR)-4 gene expression and IL8 levels, plasma carotenoids and systemic inflammation were compared between healthy-weight (BMI < 25 kg/m²) and overweight/obese (BMI ≥ 25 kg/m²) adults with asthma. Changes in these biomarkers were then compared between overweight/obese asthmatic adults randomised to a high (HFV) versus low (LFV) fruit and vegetable diet for 14 weeks.

Results: Baseline sputum neutrophil elastase, TLR4 expression and IL8 were higher in the overweight/obese (n = 106) versus the healthy-weight (n = 27) adults; conversely, plasma carotenoids were reduced. Following the 14-week RCT, neutrophil elastase decreased in the HFV (n = 33) versus LFV (n = 63) group [-28.5 (-350.4, 64.6) vs. 211.5 (-15.4, 1508.7) ng/mL, p = 0.045], as did CRP [-0.2 (-2.8, 0.8) vs. 0.8 (0.1, 4.9) mg/L, p = 0.014]. Lutein and alpha-carotene increased in the HFV versus LFV group.

Conclusions: Markers of airway neutrophils were raised in overweight/obese adults with asthma; however, neutrophil activity reduced following a 14-week high fruit and vegetable diet, while circulating carotenoids
increased. Dietary intervention may be beneficial in obese adults with asthma.

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EFFECTS OF TOCOTRIENOL-RICH FRACTION ON PREVENTION OF DETERIORATION OF BONE QUALITY

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Background/Aims: Maintenance of bone quality is important in the prevention of osteoporotic fracture. Bone quality is determined by collagen cross-links which are regulated by enzyme lysyl oxidase (LOX) in osteoblastic cells. LOX expression is known to be inhibited by activation of Janus kinase (JAK) signaling located in the upstream of LOX. But, JAK signaling is reported to be inhibited by Tocotrienol-Rich Fraction (TRF), a member of the vitamin E family. However, the effect of TRF on the LOX expression in osteoblastic cells has not been understood. Here, we have investigated the relation between TRF and LOX expression.

Methods: A human osteosarcoma cell line (MG-63) was cultured in medium containing 5 µg/mL or 10 µg/mL TRF. After 24 h of treatment TRF, we analyzed LOX mRNA expression and JAK1, JAK2 protein expression and activation. Analyses of mRNA expression and of protein expression and activation were performed by real-time PCR and western-blotting respectively. Expression and activation levels were compared TRF-treated group and untreated control group, and statistical analysis were performed by using Dunnett’s test.

Results: In TRF-treated group for 24 h, LOX mRNA expression increased (control vs. TRF 10 µg/mL, p < 0.01) while both JAK2 protein expression and activation decreased (control vs. TRF 10 µg/mL, p < 0.05), and JAK1 expression and activation remained unchanged. Conclusions: We demonstrated that TRF increased LOX mRNA expression via inhibiting JAK2 signaling. These results suggest that TRF may be effective to prevent the deterioration of bone quality.

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SCHOOL CANTEENS: A SYSTEMATIC REVIEW OF STAKEHOLDER’S PERCEPTION AND USE

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Background/Aims: This systematic review of the literature identified current research relating school canteens. In particular, the review focused on the perceptions of canteens, their use and compliance with healthy canteen policies in Australia.

Methods: A systematic review of the literature was conducted on papers published between 1948 and January 2015 from three key nutrition databases: CINAHL, Academic Search Complete and Medline. Data was extracted using the American Dietetic Association Evidence Process Manual. Eligible studies included those looking at the perceptions of school canteens, purchasing behaviour and influence, spending and food intake of key stakeholders (students 5-18 years, parents, School Principals, canteen managers, teachers and Parents and Citizen associations). Studies investigating policy compliance were also included. Two reviewers independently reviewed the papers with a third reviewing results.

Results: A total of 2,741 results were retrieved. After subsequent removal of duplicates and studies which did not meet the inclusion criteria, 11 studies were included in the review. Overall, studies were descriptive in nature. Two percent of students were reported to use the canteen daily. Boys were more likely to purchase food than girls. Non-healthy foods such as, meat pies, sausage rolls confectionary and potato crisps were the most popular foods purchased. Compliance with healthy canteen policies was reportedly low in terms of product provision due to declining funding, volunteers and student’s preference for unhealthy cheap foods.

Conclusions: Further research into strategies to improve implementation and compliance with healthy food guidelines is needed.

Funding source(s): Faculty of Health, University of Canberra.

SODIUM, POTASSIUM AND BLOOD PRESSURE IN ADULTS

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Background/Aims: Existing reviews of the sodium-blood pressure and potassium-blood pressure relationships were updated to assess whether reported relationships existed in both normotensive and hypertensive subjects.

Methods: The existing reviews selected used similar inclusion criteria such as randomised controlled trials lasting at least four weeks and reporting blood pressure. Both reviews examined resting blood pressure as the main endpoint. Their search strategies were replicated in the same databases to include more recent literature in June and August 2013 for the potassium and sodium reviews respectively. A quantitative meta-analysis tested for sub-group differences by blood pressure status.

Results: One new sodium study conducted in hypertensive people reported a significant reduction on resting blood pressure. It did not alter previous conclusions that there is a relationship in both normotensive and hypertensive groups. One new potassium study conducted in normotensive people (no effect) could not be added to the meta-analysis because only ambulatory blood pressure was reported. Despite this, the existing review of resting blood pressure was re-analysed to remove some errors. This did not alter the overall results. There was a significant interaction by population subgroup with an effect seen only in hypertensive people. However, only two studies reporting resting blood pressure were conducted in normotensive people.

Conclusions: In studies lasting at least four weeks, reducing sodium intake reduced blood pressure in both normotensive and hypertensive people although the magnitude of effect was less in normotensive people. For potassium, there is insufficient data to draw a firm conclusion in normotensive people.

Funding source(s): N/A.

NUTRITION KNOWLEDGE AND ESTIMATION OF KILOJOULES: WHO IS GETTING IT RIGHT?

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Background/Aims: For many consumers, the primary concern when choosing foods to eat out-of-home is value for money. However, the increase in the portion size (PS) of meals served out-of-home has potentially contributed to a distorted perception of appropriate PS and may incite over-eating. The aim was to determine whether consumers with high objective nutrition knowledge (NK) were more likely to correctly identify the energy (kJ) differences between ‘standard’ and ‘large’ serving sizes for 8 eating occasions (EO) using an online quiz.

Methods: The kJ for 8 ‘standard’ EOIs were provided and participants had to identify the correct kJ for the ‘large’ EOIs. Additional questions included demographics and assessment of objective NK using validated questions.

Results: All questions were completed by 401 adults; predominately females (89%); 18-34 yrs (61%); following no special diet (69%). Overall, 12% correctly identified the kJ content for 6-8 of the ‘large’ EO (6EO). Only 29% responded correctly for all objective NK questions, and were not more likely to correctly identify kJ for 6EO (Mean 3.9 ± 1.4 SD vs. 4.0 ± 1.4, p = 0.502). Overall, 58% preferred to use ‘calories’ than ‘kilojoules’ for measuring energy in food.

Conclusions: Preliminary analyses suggest that despite high nutrition