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New to Research

AB40

A critical review of primary school meal provision in the UK and Spain

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Background: Food consumed in schools, including school meals are considered to have an important role within children's diets, not only providing around 1/3 of a child's daily nutrient intake¹, but also provide an opportunity for education. To assist in these goals, there has been a movement towards standards to encourage healthy eating is modelled in schools, including in meals provided. This review aimed, to critically explore the school meal policies and provision within UK and Spain, considering reasons for differences and aspects beyond food provided.

Methods: The school meals policy from the Department of Education (or equivalent) of each country were compared and evaluated qualitatively for nutrients and foods. A full menu cycle was obtained from a sample public/state funded school in the capital city of each country, obtained via the educational authority then one week of each cycle was analysed using Nutritics v3.73 (University Edition, Nutritics LTD, County Dublin, Ireland) over their full cycle, for the standard and vegetarian (if available) options. Following testing data for normality, sample menus were tested against their national standard using a single sample t-test and between country differences were assessed using a one-way ANOVA, then for pair wise comparisons a $p < 0.05$ was taken as significant, with between group differences were identified post hoc by Bonferroni.

Results: Food based standards were met by all of the menus assessed. The nutrient standards for Spain focused on energy, for the UK countries, Scotland had higher thresholds for sodium and saturated fat. The analysis of menus found that Spanish school meals generally provided more energy and macronutrients compared to UK menus (see table 1). The Northern Irish sample menu provided (26.9 ± 11.45 g) (mean \pm standard deviation) significantly more free sugar than the English (12.2 ± 5.97 g, $p = 0.004$) and Welsh menus (14.0 ± 2.78 g, $p = 0.016$). UK standards focused on the nutritional composition of meals, where as in Spain more significance was placed on the environment and sociological aspects of eating.

Table 1 Nutrient standards that were *not* met (in non-vegetarian and vegetarian meals) by each country (+ = excess of nutrient compared to standard, - = deficit of nutrient compared to standard)

Country	Nutrient standards not met	
	Non vegetarian meals	Vegetarian meals
England	Energy ⁺ , carbohydrates ⁻ , sodium ⁺	Sodium ⁺
Wales	Energy ⁻ , carbohydrates ⁻ , zinc ⁺	Energy ⁺ , carbohydrates ⁺ , sodium ⁺ , saturated fat ⁺
Scotland	Energy ⁻ , iron ⁺	Energy ⁺ , zinc ⁻ , fibre ⁻ , sodium ⁺
Spain	Energy ⁺	Not Available

Discussion: School meals standards are highly detailed in the UK² and Spain³ and varied in style and content of expected content per day. This made it is difficult to compare the two countries. Perhaps standardising nutrients per 100 g, with portion size guidance may assist future inter country comparisons. However, providing healthy and balanced school meals could be a significant step in helping to reduce risk of diet related diseases, and it is possible that some of the non-food components including eating environment that is included in the Spanish guidance could be applied in the UK. School food is a dynamic way to improve the diets of a large number of children and should be further developed.

Conclusion: School meal standards vary in style and approach, more work is needed to explore the impact of school food standards particularly when they go beyond food and nutrients.

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AB41

A randomised crossover pilot study investigating the effects of meal and alcohol timing on postprandial lipaemia

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Background: Enhanced postprandial lipaemia may alter risk towards coronary heart disease or non-alcoholic fatty liver disease via increased tissue and arterial fat deposition, contributing to atherosclerosis.^(1,2) Alcohol is commonly consumed in differing social scenarios,⁽³⁾ although the acute effects on postprandial lipaemia have been investigated, there is currently little research in relation to timing of meal/alcohol ingestion.⁽⁴⁾ The study aimed to investigate differences in: lipid profile, lipaemia duration and glucose response on two separate study-days when: alcohol was ingested 1 hour before and alongside a test meal.

Methods: Favourable ethical approval was received by the University of Surrey Ethics Committee. Consenting participants were recruited via advertisement and attended a screening session prior to intervention. The order of the study days attended were randomised and blinded for participants. Two study days were attended, on each study day hourly blood samples were taken over an 8 hours period from 5 fasted participants (2 males, 3 females, body mass index: 20.3–26.3 kg m⁻², age: 20–25yr). A test-meal (~650 kcal, ~45 g fat) was given 1 hour after baseline bloods were taken and alcohol (3 units) was given after (1) baseline or (2) alongside the test-meal. Participants returned within 4 weeks to complete the cross-over visit. Area-under-the-curve, peak and time to peak plasma triglycerides (TG), glucose, non-esterified fatty acids (NEFA) and blood alcohol content (BAC) were measured. Statistical analysis using *T*-tests, Wilcoxon matched pairs and repeated measures ANOVA were used using IBM SPSS for Windows, Version 22.0 (Armonk, NY).

Results: Testing showed a significant difference between: pre-meal alcohol vs. with-meal alcohol for peak Breath Alcohol Content ($p = 0.023$). Differences in time to peak triglycerides ($p = 0.047$) and BAC were significant ($p = 0.018$). A significant difference in the effect over time between each intervention was shown for plasma NEFA samples ($p = 0.006$) and BAC ($p = 0.00$) were shown using two-way ANOVA.

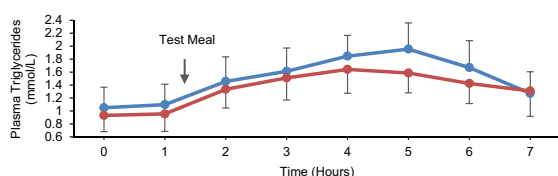


Figure 1 Hourly plasma TG concentration for 5 participants measured over an 8 hours period. Results are presented as mean values. Standard errors are represented by vertical bars. 1 visit: (●) subjects were given alcohol at time 0, after baseline bloods. 1 visit: (●) subjects were given alcohol at time 1, with the test meal.

Discussion: Results partially supported the hypothesis of a significant difference in postprandial lipaemia duration when alcohol was ingested pre-meal. They also suggest pre-meal alcohol consumption could delay time to peak TG. Previous literature suggests potential Mechanisms suggested by previous literature are: increased chylomicron and very-low-density-lipoprotein (VLDL) competition for lipoprotein lipase action, increased hepatic triglycerides and fatty acid secretion and impaired LPL activity.^(4–6)

Conclusion: Pre-meal alcohol ingestion may delay time to peak plasma triglycerides, possibly enhancing postprandial lipaemia and potentially implicating further risk of atherosclerosis.

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AB42

Changes in food neophobia and its impact on food habits, nutritional intake and future health amongst international students in Wales

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Background: A balanced and varied diet is essential in obtaining optimum nutritional status and preventing disease. (1) Barriers to healthy eating include food neophobia, which is the reluctance to eat and/or avoidance of novel foods. (2) This study aims to investigate changes in food neophobia and its impact on nutritional intake, food habits, and future health outcomes in international students studying in a university in Wales.

Methods: A prospective cross-sectional study was carried out on 30 first year international students using a self-administered questionnaire, which included Pliner and Hobden's

Food Neophobia Scale. (2) Ethical approval was obtained and students were recruited during lecture time. Food neophobia and dietary habits were measured at the start, and at three months of their course. Perceived changes to food intake was measured at three months, and compared to neophobia levels at baseline and three months, using Chi-squared analysis using IBM SPSS Statistics for Windows, Version 22.0.

Results: Food neophobia decreased significantly over time ($p = 0.04$) (Fig. 1). Students reported an increase in consumption of new foods, and expressed an open attitude to trying new foods. Participants also reported increased consumption of fruit, vegetables, potatoes, dairy, eggs and confectionary, and a decrease in fish consumption since coming to the UK (reported at 3 months). These results were compared to the student's neophobia levels at baseline (Table 1) and at three months. There was a significant difference between neophobia levels and fruit intake, with significantly more neophobic students reporting increases in fruit consumption ($p = 0.03$).

Table 1 Changes to intake and food neophobia levels at baseline (October) (* $p=0.03$).

	Total number of students	Neophilic students at baseline	Neophobic Students at baseline
Foods eaten more often			
Fruit *	12	2	10
Vegetables	13	5	8
Potatoes	13	5	8
Dairy	15	4	11
Eggs	17	6	11
Confectionary	15	8	7
Foods eaten less often			
Fish	13	6	7

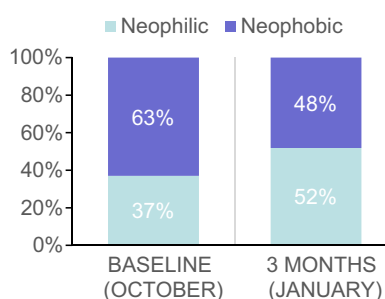


Figure 1 Changes in food neophobia over time ($p=0.04$).

Discussion: A decrease in food neophobia contradicted previous evidence which indicated that food neophobia may increase and remain elevated in international students. (3) This finding was reflected in an increase in consumption of, and an open attitude, to trying new foods. The dietary intake of international students highlighted the adoption of some positive dietary changes (increased fruit consumption), and

some negative dietary changes (increased confectionary consumption). Although trends were identified, these changes were found to be independent of neophobia levels, with the exception of fruit consumption, which increased significantly in neophobic students. Results highlight the need for further research in this area, and may provide guidance for health promotion strategies.

Conclusion: Food neophobia decreases over time in international students, with fruit consumption being dependent on neophobia levels. These results are to be interpreted with caution due to small sample size and resource constraints, with further research being indicated.

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AB43

A cross sectional study of positive body image in nutrition, dietetic and biological science university students

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Background: The presence of body dissatisfaction and its perceived role in disordered eating has been widely investigated in university students, both in nutrition and non-nutrition related courses⁽¹⁾. Less is known about positive body image, which would encompass acceptance for, and appreciation of, the body with all its flaws, i.e. body appreciation. The aim of the current study was to measure the level of body appreciation in undergraduate students with reference to course, year of study, gender, BMI and age.

Methods: 107 student volunteers were recruited at random during lectures from the Departments of Biological Sciences ($n = 51$) and Clinical Sciences & Nutrition ($n = 56$) in the University of Chester in January 2015, of which 79.4% were female and 88% were aged between 18 and 25. Ethical approval was granted by the departmental ethics committee. A questionnaire consisting of demographic information and the 13 item Body Appreciation Scale (BAS)⁽²⁾ was distributed. Participants rated each statement on a Likert scale (1 = never, 5 = always), e.g. “On the whole, I am satisfied with my body”⁽²⁾ and mean BAS scores (\pm SD) were

calculated. Data was normally distributed and analysed with independent samples t-tests and a one way ANOVA using SPSS software⁽³⁾.

Results: Individual mean BAS scores ranged from 1.85 ± 0.90 to 4.92 ± 0.28 with a total sample mean of 3.53 ± 0.54 . Males had a higher mean score than females (3.81 ± 0.40 and 3.45 ± 0.54 respectively; $p = 0.004$) and participants with a $BMI < 25 \text{ kg m}^{-2}$ had significantly higher mean BAS scores than those with a $BMI \geq 25 \text{ kg m}^{-2}$ (3.58 ± 0.53 and 3.33 ± 0.51 respectively; $p = 0.046$). No significant differences were found in BAS scores according to course, year of study or age.

All of the scores below 3.0 were from females, the majority of which were clinical sciences students (57%). Fifty-nine per cent of scores above 4 were from biological sciences students of both genders.

Discussion: Gender differences in body appreciation were consistent with previous findings which indicate males are more appreciative of their body than females in a large Austrian community sample⁽⁴⁾. Equally an inverse correlation between body appreciation and BMI has also been demonstrated previously in a community sample of American women⁽⁵⁾. This study did not find body appreciation increased with age, as has previously been demonstrated⁽⁶⁾ which could be due to the low number of participants over 25 years old in this study.

Conclusion: Overall, positive body image is prevalent in this sample of students. BAS scores did not differ according to course, year of study or age however greater levels of body appreciation were observed in males and those with a BMI less than 25 kg m^{-2} as predicted. It should be noted that the sample was unbalanced due to more females than males volunteering to participate and a higher number of students being aged 18–25 than any other age group.

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AB44

Exploring food experiences and challenges in traditionally hard-to-reach adults through a cross-sectional questionnaire

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Background: Plymouth has higher deprivation, lower life expectancy and poorer 'healthy eating' than the English average. Evidence suggests traditionally 'harder to reach' adults who fall outside official surveys, such as homeless and substance misusers, are more likely to have nutritionally inadequate diets (1). Potential environmental barriers to healthy eating include access to shops, transport and cooking facilities, lack of cooking skills and food knowledge and ill health. The aim of this study was to explore the food experiences and challenges in traditionally hard-to-reach adults in Plymouth, to inform future initiatives aimed at addressing food and nutritional inequalities.

Method: A cross sectional survey design involving a questionnaire with previously validated questions used where possible. Categories include previously identified barriers to healthy eating: i. food affordability, ii. food accessibility, iii. cooking skills, and iv. knowledge. A pilot survey ($n = 4$) confirmed content validity and question type as well as a face-to-face delivery method. Both quantitative and qualitative data were collected. Participants were recruited through convenience sampling from nine services in Plymouth reaching hard-to-reach service users. Quantitative data were analysed using IBM SPSS 21 (2). Qualitative data were analysed thematically which generated main themes of discussion from the data. Healthy eating was assessed using the previously validated Eating Choices Index (ECI) tool (3). Ethical approval was granted by Plymouth University's School of Health Professions Bachelor's Degree Ethics Subcommittee.

Results: $n = 66$ participants. $n = 60$ provided ECI scores and were used in quantitative analysis with mean ECI score: 10.9 (SD 3.29). Affordability: No association between weekly income and use of food aid schemes or ECI score. Disruptions or sanctions of benefits were significantly associated with use of emergency food schemes ($\chi^2 (2) = 10.5$; $p = 0.005$). Accessibility: 85% reporting at least one health issue of which 36% were mental health issues. Reported to affect cooking and shopping though not significantly associated with ECI score. Skills and knowledge: varied widely with no pattern based on service used or housing situation.

Discussion: ECI for this population was lower than the average score (12.3) of the stratified population (3) which may indicate lower levels of healthy eating. However ECI does not measure consumption frequency which has been indicated as important in similar populations (4). Health issues may affect cooking and shopping which warrants further investigation given the sample size and its heterogeneous nature. Food aid

use was significantly more likely in those who had experienced benefit disruption. Food experiences varied widely with individual circumstance and perceptions, confirming previous research indicating marginalized populations are heterogeneous in nature (5).

Conclusion: Healthy eating may be lower and health issues are prevalent. The high use of food aid indicates the importance of sustainable incomes and warrants further investigation into the effects of this on nutrition and food security. Diverse challenges to healthy eating in hard-to-reach populations may necessitate more creative and tailored strategies to benefit this group.

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AB45

An exploratory study of hand length as a surrogate of measure height

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Background: Nutritional screening is used to detect adults who are at risk of malnutrition (1). Part of this process involves the calculation and classification of Body Mass Index (BMI). However, as the measurement of height in clinical practice is not always possible, surrogate measurements are commonly used. Hand length as a predictor of height (2), has recently been proposed as an alternative surrogate measurement to more established measurements of ulna length, knee height and demispan.

Aim: To explore the accuracy of hand length as a predictor of height and compare findings to other established surrogate measurements (ulna, knee, demispan), measured height and subsequently calculate BMI.

Methods: An exploratory cross sectional pilot study using convenience sampling of healthy participants recruited from a university population was undertaken. The exclusion criteria applied to those unable to stand to have their height measured, had a leg or arm amputation, or curved spines. Ethical

approval for this study was provided by the University's Research Ethics division. Height was estimated from hand length using methodology outlined by (2), while ulna length, knee height and demispan measurements used (1) methodology, and were compared to measured standing height. BMI was calculated using measured weight, measured height and each surrogate measurement. Statistical analysis involved Bland-Altman plots to determine the limits of agreement between measured height and each of the predicted measurements. Significance between these measurements was determined using Paired Sample t tests.

Results: Healthy participants were recruited from a Scottish university population ($n = 22$) with a mean age of 23.9 years. Twenty-one participants were female and one was male. All subjects were Caucasian. Bland Altman plots showed an over and underestimation of height, as showed in Table 1. Descriptive statistics relating to BMI calculations is shown in Table 2 below where significant difference is reflected as $p < 0.05$.

Table 1 Measured height compared to each surrogate measurement

	Hand length HE*	Ulna length HE*	Demispan HE*	Knee height HE*
Mean difference (cm)**	-4.60	2.70	5.30	-2.40
Upper limit (cm)**	4.50	12.90	13.00	5.70
Lower limit (cm)**	-13.60	-7.50	-2.40	-10.0

Table 2 BMI calculated using each surrogate measurement

	Hand Length HE*	Ulna length HE*	Demispan HE*	Knee height HE*
Minimum (kg m^{-2})**	17.70	19.40	18.30	18.30
Maximum (kg m^{-2})**	30.10	32.40	33.20	29.70
p value	0.00	0.02	0.00	0.01

*HE = Height Estimation **corrected to 2 decimal places.

Discussion: Each surrogate measurement over or underestimated measured height, with hand length overestimating height by a mean difference of -4.6 cm.

The variation of BMI calculations highlights the importance of accurate height measurements as a component of nutritional screening. Limitations of this study include the small sample size, therefore further research in a larger more diverse population would be recommended.

Conclusion: In conclusion hand length was found to be no more accurate for the estimation of height than the already established surrogate measurements.

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AB46

Validity of digital photography as a means of assessing the dietary intake of post-operative colorectal surgery patients

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Background: Dietary assessment tools (e.g. 24-hr recall, diet diaries, food record charts) are widely used in acute, community and research settings to estimate the nutritional intake of service-users. The outcome of dietary assessment directly impacts on patient care therefore accurate and reliable assessment methods are needed. Digital photography (DP) has been used previously in a variety of groups to estimate dietary intake including children¹ but studies in the acute clinical setting are sparse. The aim of this cross-sectional study was to determine whether digital photography could be used as a method of dietary assessment in the acute clinical setting.

Method: Data was collected on an acute colorectal surgical ward. Main meals (lunch and evening) which consisted of two courses (soup and main course) were analysed in the study. Each component of the meal was weighed (g) prior to the meal being served to the patient and any left-overs were weighed at the end of the meal service. Energy (kcal) and protein (g) content of the meal provided and weighed left-overs were determined using the database of standard hospital recipes on the dietary analysis programme, 'Nutmeg'². In addition, the whole meal was photographed prior to the meal service and any leftovers photographed at the end of the meal service using a digital camera (Canon IXUS 127 HS). Photographs were compared to the food atlas³ to determine an estimated weight of food provided and left-over. These weights were then used to estimate energy (kcal) and protein (g) of the meal provided and leftovers using Nutmeg². Mean difference and 95% limits of agreement between the two methods was calculated using Bland-Altman plots⁴. Ethical approval was obtained from QMU research ethics committee.

Results: There was no significant difference between estimates of weight, energy or protein for either provision or leftovers.

Discussion: This study indicates that digital photography may be used to estimate dietary intake. There were no more than two outliers (outside the 95% confidence interval) per Bland-

	Weighed (soup) n = 14	Lower (upper) limits of agreement (soup)	Photo estimate (soup)	Weighed (main course) n = 36	Photo Estimate (main course)	Lower (upper) limits of agreement (main course)
	Mean ± SD		Mean ± SD	Mean ± SD	Mean ± SD	
Weight Provision (g)	199 ± 26.6	-54 (50)	201 ± 0.0	314 ± 127.9	293 ± 123.9	-192 (234)
Weight Leftover (g)	10 ± 20.1	-33 (21)	35 ± 55.0	76 ± 84.5	93 ± 102.8	-121 (121)
Energy Provision (kcal)	97 ± 56.8	-27 (27)	98 ± 57.5	425 ± 171.8	396 ± 160.7	-222 (281)
Energy Left-over (kcal)	7 ± 18.5	-14 (9)	9 ± 20.3	107 ± 122.4	125 ± 151.9	-162 (127)
Protein Provision (g)	3.4 ± 3.1	-1 (1)	3.4 ± 3.1	21 ± 7.6	22 ± 9.8	-14 (13)
Protein Left-over (g)	0.14 ± 0.4	-1 (1)	0.14 ± 0.4	5 ± 6.0	6 ± 7.5	-8 (6)

Altman⁴ plot for both soups and main courses for provision and left-over weight, energy and protein.

Conclusion: This study has shown that digital photography is a feasible method of dietary assessment in the acute clinical setting but needs further validation with a larger sample size and with different food delivery systems.

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AB47

Short-term adherence to a very low calorie diet increases heart rate variability and reduces 24 hours heart rate in obese subjects: a randomised controlled pilot study

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Background: Heart rate variability (HRV), a well accepted index of autonomic nervous system (ANS) function, is the variability in interbeat intervals over short and longer time scales. Depressed HRV common in obesity, is correlated with increased mortality risk (1). Weight loss was associated with

improved HRV in a single group, uncontrolled study (2) but the effect of a very low calorie diet (VLCD) has never been compared to a control. The aim of this study was to determine if intense, energy restriction following a 7-day VLCD promotes an increase in HRV (indicative of improved ANS function) relative to a moderate calorie diet (MCD), in obese, but otherwise healthy, humans.

Methods: 31 participants (BMI 30–42 kg m⁻², aged 32–65 yrs, non-smokers), recruited via public advertisement, completed this randomised, controlled, parallel-arm trial. Subjects on VLCD were supplied with commercially available food packs (Lighterlife) to replace all meals. This provided approximately 600 kcal day⁻¹ and supplied 100% RNI of all vitamins and minerals. The MCD control group were given tailored dietary advice to reduce energy intake to a 500 kcal deficit of calculated requirements. Actiheart monitors (CamNtech Ltd, Cambridge, UK), which subjects wore for 24 hours, were fitted by researchers on the chest at baseline and on day 6 of the 7-day dietary intervention. Height, weight, body composition and blood pressure were also measured. The study was approved by King's College London Research Ethics Committee and all procedures were carried out in accordance with the Declaration of Helsinki. The primary HRV outcome was the change in standard deviation of all normal-to normal intervals (SDNN), a robust measure of overall HRV. Secondary HRV outcomes included high frequency (HF) power (which primarily reflects parasympathetic overflow). Independent t-tests compared clinical and demographic factors, heart rate, IBI, activity and HRV parameters between VLCD and MCD groups. Values are presented as mean ± standard error. A level of $p < 0.05$ was defined as statistically significant.

Results: At follow up, mean weight loss was -2.1 ± 1.0 kg following VLCD ($n = 16$) versus -0.8 ± 1.0 kg with the MCD ($n = 15$) ($p < 0.001$). BMI ($p < 0.005$) and % body fat ($p < 0.05$) were reduced to a greater extent by VLCD compared to MCD. Mean 24 hours beat-to-beat heart rate was reduced following VLCD ($n = 14$) compared to MCD ($n = 15$) (Δ VLCD- Δ MCD: -7.1 ± 2.4 beats per minute, $p < 0.05$). Mean SDNN increased following VLCD ($n = 13$) compared to a decrease following MCD ($n = 12$); Δ VLCD- Δ MCD: 20.5 ± 10.7 msec ($p = 0.07$) but this difference was not statistically significant. HF was statistically significantly increased following VLCD ($n = 14$) compared to an overall decrease following MCD ($n = 15$); Δ VLCD- Δ MCD: 164.3 ± 67.6 msec, ($p < 0.05$).

Discussion: The increase in HF following VLCD is in line with longer term studies involving energy restriction and weight loss in obese populations (3, 4). Although the between group difference in SDNN was not significant in this study, an earlier study (with a longer intervention period) found that SDNN increased significantly from baseline following adherence to a VLCD (2). Improvements in HRV are linked to overall cardiovascular health benefits.

Conclusion: The hypothesis that a short-term VLCD would increase SDNN compared to a MCD was neither proved nor disproved. A marker of parasympathetic function was increased; thus, short-term, intense energy intake restriction may have rapid effects in improving cardiac autonomic function in obese subjects but a larger RCT is needed to investigate this more thoroughly.

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AB48

A cross-sectional study investigating the relationship between adherence to a Mediterranean-style diet and nutritional knowledge among cardiac rehabilitation patients

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Background: A Mediterranean-style diet is recommended in the secondary prevention of coronary heart disease¹. Adherence to a Mediterranean diet can be influenced by factors such as nutritional knowledge and socioeconomic status². The aims of this study were to investigate the relationship between adherence to a Mediterranean diet and nutritional knowledge among cardiac rehabilitation patients and to identify the relationship between these two variables and a measure of patients' socioeconomic status.

Methods: Participants were recruited at their initial cardiac rehabilitation assessment for this cross-sectional study. Adherence to a Mediterranean diet was assessed using the 14-point Mediterranean Diet Adherence Screener (MEDAS-14), with a score of ≥ 9 indicative of acceptable adherence³. Nutritional knowledge was measured using a validated 100-item nutritional knowledge questionnaire (NKQ) covering four topics: current dietary recommendations, sources of nutrients, everyday food choices and diet-disease relationships⁴. Participants' postcodes were collected and an area-based measure of socioeconomic status was determined

using the Scottish Index of Multiple Deprivation (SIMD). Spearman's rho correlation analysis was used to find associations between these variables.

Ethics: Ethical approval was gained from the Research Ethics Committee at QMU (April 2015).

Results: The MEDAS-14 was completed by 22 participants, 10 of whom also completed the NKQ. The median (IQR) MEDAS-14 score ($n = 22$) was 6.5 (6, 10). The median (IQR) NKQ total score ($n = 10$) was 72 (64, 78.8). No significant relationship was found between participants' adherence to a Mediterranean diet and nutritional knowledge ($n = 10$). Significant positive associations were found between participants' SIMD rank and MEDAS-14 scores ($n = 22$) ($r = 0.792$, $p < 0.01$) and between SIMD rank and the 'sources of nutrients' section scores of the NKQ ($n = 10$) ($r = 0.636$, $p < 0.05$). No significant relationship was found between SIMD rank and total NKQ score.

Discussion: Consistent with previous research findings⁵, this study indicates that adherence to a Mediterranean diet and aspects of nutritional knowledge are positively correlated with socioeconomic status, as measured by the SIMD rank. There was no association observed between adherence to a Mediterranean diet and nutritional knowledge, however the small sample size ($n = 10$) should be taken into consideration when interpreting these results.

Conclusion: High importance should be placed on delivering individualised dietary advice within the cardiac rehabilitation setting, taking into consideration the patient's socioeconomic status.

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AB49

Retrospective study of clozapine related weight gain, course and predictors in forensic units

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Background: The Scottish Government [1] are calling for improvements in the management of clozapine induced cardiometabolic side-effects such as weight gain. Studies have indicated the prevalence of cardiometabolic disease is as high as 52.4% in inpatient mental health units [2]. Forensic inpatients may be at especially high risk due to prolonged exposure to an obesogenic environment [3]. This study was conducted in two forensic inpatient units with a total population of 124 (92% male) and an average length of stay of 3 years. Biannual audits identified a stable mean BMI of 30 kg m^{-2} since 2011. This study aimed to review weight change in a subset of the units inpatients after commencement of clozapine. Additionally, it explored predictors of weight change.

Methods: A retrospective audit of 16 case notes was conducted in male patients in two forensic units, all of whom were taking clozapine. Weight change was measured one month prior to starting clozapine and then monthly until the 10th month of treatment and the temporal course of weight change plotted. Spearman's rho correlation was used to determine if the samples' characteristics; age, baseline BMI (BBMI) and their weight change at 1 and 2 months could predict their weight change at 3, 6 and 10 months. Mann-Whitney U test was used to compare weight change between patients taking and not taking each group of concomitant medication in addition to clozapine prescription. Groups were concomitant antipsychotics (prescribed; yes 10: no 6), weight promoting medication (prescribed; yes 8: no 8) and medication associated with weight loss (prescribed; yes 4: no 12). To assess for baseline bias of weight between the sample the general forensic population, the samples' baseline BMI was compared to the mean BMI of the general population of the forensic units using the Wilcoxon Signed Ranks Test. Ethics approval was granted by NHS Greater Glasgow and Clyde Forensic Directorate's Research and Audit Committee, GCU Ethics Committee; access to patient's clinical notes was approved by NHSGGC's Caldecott Guardians.

Results: The sample and forensic population showed no significant difference in BMI at baseline ($p = 0.756$). The most rapid weight gain was observed over the first 3 months then reduced between months 3–5, and slowed again between months 5–10. For all other main results see table 1 below.

Table 1 Results of analysis on 16 patients prescribed clozapine (p values are shown brackets)

Month	Mean weight gain (kg)	Mean difference in weight (kg) between those taking & not taking each medication			Correlation with weight change at months 3, 6 and 10			
		Concomitant antipsychotics. yes 10: no 6	Weight promoting medication yes 8: no 8	Weight reducing medication yes 4: no 12	Month 1	Month 2	Age	BBMI
3	4.025 (0.004)	4.9 (0.016)	1.5 (0.574)	2.6 (0.379)	0.592 (0.016)	0.920 (0.0001)	0.142 (0.142)	-0.135 (0.619)
6	4.867 (0.031)	11.4 (0.005)	2.1 (0.536)	2.9 (0.489)	0.636 (0.011)	0.908 (0.0001)	0.063 (0.063)	-0.129 (0.648)
10	7.842 (0.023)	14.8 (0.008)	7.2 (0.132)	1.2 (0.933)	0.616 (0.033)	0.874 (0.0001)	-0.167 (0.167)	-0.088 (0.787)

Discussion: Clozapine was associated with a distinct pattern of weight gain that was similar to other studies. Patients taking concomitant antipsychotics had the highest weight gains and month 2 most accurately predicted the amount of weight gained after long term treatment with clozapine [4]. Other medications, age and BBMI were not associated with weight gain.

Conclusion: Further work is required to see if close monitoring with a targeted intervention strategy could prevent or reduce weight gain following clozapine prescription.

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AB50

A quantitative analysis of the accuracy and safety of health messages related to Type-2 diabetes posted on microblogging site Twitter

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Background: It is thought that more than 70% of the population who use the internet use social media⁽¹⁾. A survey of patients and professionals use of social media demonstrated that almost 60% of patients who used Twitter did so to increase knowledge and to exchange advice whereas 51.2% of

professionals used it to communicate with colleagues and for marketing purposes⁽²⁾. This current study was to establish if information about type 2 diabetes posted on Twitter is accurate and/or safe based on current guidelines^(3, 4, 5).

Methods: Data was collected via a pragmatic quasi-experimental design to analyse the tweets posted on Twitter. Ethical approval was obtained from Coventry University Ethics Committee. To keep the data collection manageable a 5 day period from 29th March – 2nd April 2015 was selected which was limited to 100 tweets. Information about the ‘Tweeter’ was obtained from the public ‘Bio’ on their Twitter profile. Tweets were collected from four simultaneous searches using the hashtags #Diabetes (n = 30) #DiabetesDiet (n = 31) #T2DM (n = 8) #Type2Diabetes (n = 31). Tweets were analysed using non-parametric tests (Mann Whitney U and Kruskal–Wallis), to test the alternative hypothesis that ‘tweets posted by Healthcare Professionals (HCPs) are more accurate and/or safe than those tweeted from other sources’.

Results: Overall, tweets were 44% accurate, 41% partially accurate and 15% inaccurate; of these 86% were safe and 14% were unsafe however these results were not statistically significant (p = 0.37). Tweets posted by HCPs were safer than other sources (p = 0.025). HCPs were more accurate (p = 0.331) and safer (p = 0.049) than members of the public. There were a total of 16 tweets from HCPs of which 5 tweets were from dietitians. Finally hashtags #T2DM and #Diabetes were the most accurate, however this was not statistically significant (p = 0.415). #Diabetes was the safest however it was also not statistically significant (p = 0.355). #T2DM was accurate but it was only used by HCPs, therefore it is difficult to establish whether patients would benefit from the information contained in these tweets.

Discussion: The results indicate that although tweets posted by HCPs are more accurate and safer than other sources, the results are not all statistically significant; however there is some argument that these results are subject to type 2 errors due to the small sample size. The research highlighted the fact that any information posted or retweeted should be evidence based and that hashtags #T2DM and #Diabetes provide more accurate information.

Conclusion: Developing recognised and widely used hashtags would enable HCPs to disseminate evidence based information that can easily be found by members of the public.

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AB51

An evaluation of the impact of dietetic intervention on quality of life in adults with Irritable Bowel Syndrome

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Background: Irritable Bowel Syndrome (IBS) is a functional gastrointestinal disorder for which a definitive cause has yet to be elucidated. Sufferers have reduced quality of life (QOL) and increased use of health care resources compared with matched controls⁽¹⁾. Dietary advice is considered a key part of IBS management^(2,3), however there are currently no studies in the literature that demonstrate the effect of standard IBS dietary advice, offered to patients by dietitians within the National Health Service (NHS), on QOL. The aim of this study was to investigate the impact of standard dietetic intervention on QOL and IBS symptoms in adults with IBS in an NHS primary care environment and evaluate whether advice given followed major national guidelines.

Methods: In this service evaluation 36 adults (mean age 43, range 20–77; 89% female) with IBS were recruited consecutively over 6 months from GP and consultant referrals (40 eligible to participate; 1 refusal, 3 unable to complete questionnaires). Participants received usual dietetic care and were asked to complete two QOL questionnaires (generic EQ-VAS⁽⁴⁾ and disease specific IBS-QOL⁽⁵⁾) and The Birmingham IBS Symptom Questionnaire⁽⁶⁾ at initial and one subsequent appointment, as agreed with the patient (1–5 months later). Data was treated as ratio and analysed using SPSS v20. The level of significance was 0.05. Data was tested for normality by visual examination of histograms and the Shapiro-Wilk test. Differences between before and after mean scores were analysed using a paired samples t-test. Ethical approval was granted by the Faculty of Life Sciences Research Ethics Committee of The University of Chester.

Table 1 Change in questionnaire scores following dietetic input

Outcome measure	Mean baseline score (SD)	Mean follow up score (SD)	Mean change	p value
EQ-VAS	56.42 (21.53)	56.44 (23.05)	0.02	0.994
IBS-QOL	47.24 (23.07)	49.96 (22.52)	2.72	0.444
Symptoms	2.26 (0.71)	1.88 (0.69)	−0.38*	0.008

*Negative result denotes improvement in symptoms.

Results: Most participants (28/36) were given first line dietary advice^(2,3), with regular meal pattern being the most common change suggested (23/36), followed by reduction in caffeine (12/36), increasing fluid (11/36) and adjusting fibre intake (10/36). Total symptom scores improved significantly following dietetic intervention and there was a trend towards improvement in disease specific QOL measures, although this was not statistically significant (Table 1).

Discussion: The study demonstrated that when dietitians followed major national guidelines, in the form of a 30 minute intervention with patients, a significant improvement in IBS symptoms was reported. These results compare favourably with outcomes from other more intensive dietary interventions with non-dietetic staff⁽⁷⁾. The results from the current study also suggest the disease specific questionnaire is more sensitive in this population. However, the current data is limited by the lack of a control group and randomisation, which were not possible for practical reasons.

Conclusion: This study demonstrates that NHS dietetic intervention is associated with an improvement in IBS symptoms but not a significant improvement in QOL and adds new information relevant to patient centred care in an area of limited evidence.

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AB52

An analysis of the food group composition and adequacy of adolescent diets in an underprivileged area of the UK

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Background: In areas of deprivation, where health inequalities exist, deficiencies in adolescent diets are amplified¹ with long-term health consequences. This study aimed to analyse relative percentage of food group consumption of adolescents' diet in an underprivileged area.

Method: A secondary analysis of one hundred and seventeen seven-day food diaries of 13–16 years olds from a state school in a deprived borough of Greater London was carried out as part of a larger study investigating the behavioural effects of supplementary nutrition². Portion sizes according to manufacturers weights were used where available otherwise estimates were taken. All diaries were analysed including those completed with <7 days. Food group consumption data were compared to dietary guideline amounts, Eat-Well recommendations, and NDNS for the comparable age group³. Data were analysed using Spearman Rank in SPSS. Ethical approval was granted from Central University Research Ethics Committee.

Results: The average adolescent diet consisted of 29% fatty and sugary foods, 30% starchy foods, 18% meat and other proteins, 14% fruit and vegetables and 9% dairy foods. Adolescents consumed a mean average of 1.27 portions per day of fruit and vegetables. 68% of the sample had inadequate dairy intakes, but having breakfast cereal positively correlated to dairy consumption ($r = 0.42$ $p < 0.001$) and dairy intake positive correlated to fruit and vegetable intake ($r = .390$ $p < 0.001$). 35% of adolescents had a soft drink intake that contributed more than 10% their total daily energy intake. Energy derived from snack foods (Chocolate, crisps and sweets) provided an average of 11% of total daily energy intake.

Discussion: The adolescent diet was of a poorer composition than Eatwell Plate guidelines. The typical diet showed limited variety with a reliance on nutrient poor and energy dense foods, which could have long-term health consequences. 98% of these adolescents did not meet the NDNS mean average intake of 2.9 portions of fruit and vegetables³. However, the NDNS sample is derived from a more affluent and relatively small sample size and it may not be representative of deprived areas. 35% of adolescent's soft drink intake

alone contributed to more than 10% of their daily energy intake, therefore exceeding the recently proposed guidelines for free sugars⁴. These alarming proportions may explain high levels of dental caries in the area and suggests that proposed 5% free sugar targets⁴ might be unrealistic for this population.

Conclusion: Food group analysis of adolescent diet in a deprived area suggests that there are significant variances between the percentages of food groups eaten in comparison to recommended National guidelines; fruit and vegetable intake at 1.27 portions per day versus 5-a-day target and 21% of the daily energy intake derived from snacks and soft drinks versus a free sugar target of 5% are particularly stark examples. Identifying these at risk populations and targeting public health initiatives towards correcting this poor food group dietary composition will be paramount in averting future health implications.

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AB53

Attitudes of parents towards the 'Fit Together' childhood obesity prevention programme: a qualitative study

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Background: The latest available data for England show that childhood obesity continues to be a major public health concern with 9.3% of 4–5 years old and 18.9% of 10–11 years old children found to be obese⁽¹⁾. The aim of the study was to explore attitudes towards a community based childhood obesity prevention project among parents participating in the programme.

Methods: The 'Fit Together' programme was provided in socio-economically deprived areas of Leeds which, at the time of the research study, was in its final year of running. The programme was delivered for 2 hours each week over a six week period by community health educators, and involved health education and cooking sessions. A convenience sample of parents who had attended at least one session of the Fit Together programme, delivered between November-December 2014, were recruited from a children's centre (where families access health advice and related activities with their children aged 0–5yr) and a primary school. Semi-structured interviews were conducted using a topic schedule with prompts, and were digitally recorded. A short screening questionnaire was completed to obtain demographic information. Three parents were present in each of the two Fit Together sessions allocated for recruitment. These six parents were recruited to the study and were interviewed. Interviews were transcribed verbatim, transcripts manually coded and thematic analysis conducted using a framework approach. Ethical approval for the study was obtained from the Faculty of Health & Social Sciences Local Research Ethics Coordinator, Leeds Beckett University.

Results: Participants were all mothers with 1–3 children, and mean age was 27 years. Four participants self-defined their ethnicity as White British and the remaining two as Pakistani. Themes emerging from the interview data suggested that participants' appraisal of the programme was positive and they reported benefits in behaviour change relevant to addressing childhood obesity. Parents felt the programme was logistically suitable, and had appropriate content and leaders. All participants would recommend the programme and highlighted the development of their cooking skills, which related to an increase in home cooking and in fruit and vegetable consumption. The opportunity to involve their children and spend time with them learning skills was a strongly held view among respondents. Parents felt the programme had also increased their awareness of nutrition content and children's dietary habits. However, the view that an extended programme and subsequent follow-up were needed was commonly held. Additional benefits beyond behaviour change were also expressed. For example, the importance of social interaction was clear, with respondents reporting the alleviation of boredom and isolation while attending the programme, as this participant states: "Something to do ain't it? Gets you out. There's nothing else to go to" (White British, 23yr, 2 children). Participants also reported exchanging cultural beliefs and learning new styles of cooking from people from different backgrounds.

Discussion: The findings of this first exploration of parents' attitudes to Fit Together supports existing literature on the value of community educators in delivering health interventions⁽²⁾. Beneficial behaviour change such as increased home-cooking was consistent with previous programmes⁽³⁾.

Conclusion: Attitudes towards Fit Together were positive, with mothers viewing the programme as acceptable and beneficial.

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AB54

"A blessing and a curse" – A systematic review and metasynthesis of the experiences of home enteral tube feeding for adult cancer patients and their carers

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Background: Home enteral feeding (HEF) and cancer survivorship are becoming more prevalent. Greater understanding of the impact of HEF on cancer patients and caregivers will facilitate improvements in provision of longer-term aftercare and appropriate support. This metasynthesis aims to improve understanding of the experiences of HEF for cancer patients and their caregivers.

Methods: Systematic procedures were used for search strategy, study selection, quality assessment and analysis. Thirteen electronic databases were searched during July 2014 using predefined search terms, inclusion/exclusion criteria and quality criteria⁽¹⁾ for qualitative empirical English language studies. Studies undertaken between 1980 and 2014 were searched for after considering the introduction of percutaneous endoscopic gastrostomy (PEG) in 1980⁽²⁾. Findings were synthesised using the principles of meta-ethnography⁽³⁾ and a resulting 'line-of-argument' and conceptual model developed to explain key emerging concepts (Figure 1).

Results: Seven studies (six published, one unpublished) fulfilled selection criteria and were included for synthesis. This encompassed the accounts of just 48 cancer patients and 16 of their caregivers over a 17-years timespan (1998–2014) with six studies undertaken in the last seven years. Three core concepts were identified and used to develop a model representing cancer patients and caregivers' experiences of HEF and disruption to oral intake (Figure 1): ambivalence, transition and coping with a new reality. Experiences of HEF are characterised by ambivalence as a result of weighing up individual, relationship and lifestyle losses with acknowledged benefits of tube feeding.

HEF experiences are interwoven with the inability to eat and transition back to oral diet. Benefits outweigh burdens when positive strategies are adopted to cope with the new reality and are strongly influenced by provision of information, training and support by professionals. Advance attention to physical and psychological support provision to better prepare patients for HEF experiences, and caregivers for the challenges of supporting patients, is paramount.

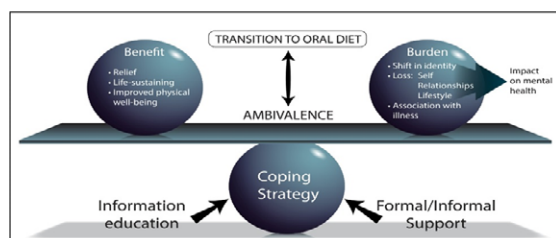


Figure 1 Line of argument synthesis: conceptual model to explain emerging concepts.

Discussion: Cancer diagnosis and treatment impart significant physical and emotional strain for patients and caregivers. Commencing HEF may exacerbate strain. Promotion of coping strategies to aid adjustment to losses encountered and adaptation to the new normality is an important aspect of treatment and should be identified as a high priority for clinical practice⁽⁴⁾. Study limitations include researcher inexperience, potential for bias throughout search strategy and consideration of changes in HEF practice over time affecting perceptions.

Conclusion: This study demonstrates the synthesis of existing qualitative data to provide a new interpretation of cancer patients' and caregivers' experiences of HEF, highlighting the ambivalence felt as a result of the interrelated experiences of HEF and inability to eat, and the ease with which burdens can overshadow benefits.

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AB55

A survey to investigate the use of nutritional care pathways in the community

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Background: Most cases of malnutrition (93%) originate in the community (1), however malnutrition is often under-recognised and under-treated. NICE guidelines recommend that an appropriate care plan be put in place for those at risk of malnutrition (2), however implementation of this guidance in the community is limited (3). The Older People's Essential Nutrition (OPEN) project, delivered by Wessex Academic Health Science Network's Nutrition programme, aims to raise awareness of malnutrition and implement nutrition care pathways in Eastleigh, Hampshire. This survey aimed to characterise the delivery of nutritional care, from screening to care planning, in this setting prior to the implementation of OPEN project resources.

Methods: A staff representative from each team within the three community sectors (healthcare: 3xGP practices, community care team; social care: social work, occupational therapy and community independence teams; 1x care home) participating in the OPEN project was invited to participate (September 2014 to March 2015). The paper based survey included 38 open and closed questions covering use of nutrition screening tools (NSTs) and care planning. It was pre-tested with a GP and Nurse from one of the participating GP Practices, no amendments were required. The OPEN dietitian met participants at their place of work or telephoned them to complete the survey. Responses to the survey questions were recorded on paper, taking approximately 10 minutes to complete. Responses were entered into an Excel spreadsheet and checked for completeness prior to analysis. Open questions were analysed according to themes, which were verified by the lead OPEN dietitian. Closed questions were analysed according to frequency of responses (n, %) according to sector (health care, social care or care home) as statistical comparisons between staff groups could not be made due to the small sample size. Ethical approval was not required for the OPEN service development project.

Results: Representation from all of the care sectors participating in the OPEN project was achieved, with 13 people completing the survey (Health care = 7 (3 GPs, 2 Practice Nurses, 2 Community Nurses), Social care = 3 (1 Social Worker, 1 Occupational Therapist, 1 Care Manager), Care home = 3 (1 Manager, 2 Assistant Managers). Most participants, (n = 9, 69%) reported their teams did not routinely use a NST and only four participants teams (healthcare = 1, care home = 3) implemented nutritional care plans. Of those that routinely

used a NST, all reported using the 'MUST', followed by use of nutritional care plans in line with national policies. Staff from the social care sector did not screen or implement nutrition care planning.

Discussion: This survey found that use of a NST and subsequent care planning varied within and between sectors in this locality. These findings, are supported by a previous community study (3), due to the small sample size of the present survey the results may not be generalisable to the wider community setting. The role of the social care sector in screening and nutrition care planning should be considered within a nutritional care pathway (2).

Conclusion: Nutritional care pathways are not routinely used by all sectors in this community setting. There is a need to explore how best to implement nutritional care pathways in this setting.

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AB56

Health, not weight loss, focused programmes (HNWL) versus conventional weight loss programmes (CWL) on cardiovascular risk factors: A Cochrane review

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Background: CWL programmes promote weekly weight loss targets and weight loss is the intended outcome, however weight regain is common. HNWL programmes do not focus on weight loss, but focus on health and well-being; any weight loss is coincidental. These programmes claim to be more beneficial for health and longevity. Cardiovascular disease (CVD) is the primarily cause of death across the globe, this review will compare the impact of these programmes on cardiovascular disease risk factors (Khasteganan et al., 2014).

Aim: To compare the effects of HNWL programmes with those of CWL programmes on cardiovascular risk factors.

Methods: We searched following databases: CENTRAL, MEDLINE, EMBASE, PsycINFO, CINAHL and ASSIA. The key terms included: non-diet*, health at every size, HAES, *holistic, intuitive, mindful, abdominal fat, overweight, obesity, body fat and fat mass. We combined the outcomes from all the studies in a meta-analysis using a fixed effects model. We investigated heterogeneity with sub-analysis. Inclusion and exclusion criteria were applied to select studies. Selected studies were assessed for risk of bias. Two authors selected and assessed studies; a third author was consulted where disagreements arose. Primary outcomes included blood lipids (total cholesterol, LDL-cholesterol, HDL-cholesterol and triglycerides); blood pressure and body weight. Secondary outcomes included dietary intake; physical activity; alcohol intake and psychosocial wellbeing (self-esteem, body image avoidance, depression, binge eating, drive for thinness, bulimia and body dissatisfaction, hunger, disinhibition and restrained eating).

Results: Improvements in blood pressure favoured the CWL programmes and improvements in blood cholesterol were generally in favour of the HNWL programmes but differences were small. In the short term, changes in body weight were in favour of the CWL programmes, but in the long term, these differences favoured the HNWL programmes. In the HNWL programmes disordered eating patterns improved more (Table 1.).

Outcomes	Absolute effects* (95% CI)		No. of participants (studies)	Quality of the evidence (GRADE)	Comments
	Mean in control group	Mean change in the intervention			
Total cholesterol:HDL ratio	-0.05 to -0.1 mmol L ⁻¹	-0.21 mmol L ⁻¹ (-3.91 to +3.5)	78 (2 RCTs)	⊕○○○ VERY LOW	Likely risk of attrition bias
Systolic Blood Pressure (BP)	-5.6 to -1.7 mmHg	+1.14 mmHg (-3.56 to +5.84)	78 (2 RCTs)	⊕⊕○○ LOW	Likely risk of attrition bias
Diastolic Blood Pressure (BP)	0.5 to -2.3 mmHg	+0.15 mmHg (-3.34 to +3.46)	78 (2 RCTs)	⊕○○○ VERY LOW	Likely risk of attrition bias
Weight (Kg)	6.5 to 1.5 kg	-0.71 kg (-2.44 to +1.0)	280 (5 RCTs)	⊕⊕○○ LOW	2 studies has high risk of attrition bias, significant heterogeneity, although little difference found with sensitivity analysis
Body dissatisfaction	-2.6	-4.3 (-8.32 to -0.28)	38 (1 RCT)	⊕⊕○○ LOW	Only one study with high risk of attrition bias
Restrained eating behaviour	2.2	-4.3 (-6.77 to -1.83)	38 (1 RCT)	⊕⊕○○ LOW	Only one study with high risk of attrition bias

Discussion: In the long term, the HNWL programme shows no significant difference in cardiovascular risk outcomes of body weight, blood pressure, blood glucose, blood cholesterol or depression to the CWL programmes. The HNWL programmes significantly improved behaviours in relation to disordered eating, compared to the CWL programmes.

Conclusion: The HNWL programmes potentially offer an alternative approach to the restrictive eating techniques and body dissatisfaction of CWL programmes without detriment to blood lipids, blood pressure and body weight. There are few, high quality RCTs in this area.

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AB57

An investigation of the cost of omega 3 supplementation to meet EPA and DHA recommendations

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Background: Eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA) supplementation is thought to be beneficial in the treatment of hypertriglyceridemia and rheumatoid arthritis (1–2). However supplement price can be variable. The primary aim of this study was to investigate the cost of using omega-3 fatty acid supplements readily available on the UK market to meet EPA and DHA recommended intakes. The secondary aim of the study was to investigate whether there is a significant difference in the EPA and DHA content of premium and high street store own brand supplements.

Methods: Twelve products from a UK high street chemist online store were selected. Four products were categorised as ‘own brand’ supplements and eight as ‘premium brand’ supplements. Cost (£/mg EPA+DHA) for each product was determined and used to calculate the cost of meeting EPA and DHA intake recommendations. Seven recommendations were investigated: North Atlantic Treaty Organisation (NATO), 1989; European Academy of Nutritional Sciences (EANS), 1998; European Food Safety Authority (EFSA), 2010; International Society for the Study of Fatty Acids and Lipids (ISSFAL), 2004; National Heart Foundation of Australia (NHFA), 2008, American Heart Association (AHA), 2003 and Arthritis Research UK (ARUK), 2012. An independent samples *t*-test was performed to assess differences in the costs of meeting recommended intakes between product groups. An independent *t*-test was performed to assess differences in total EPA and DHA content between product groups.

Results: No significant difference was found in EPA and DHA content between the own brand products and the premium brand products (own brand = 292.5 mg (\pm 158.0); premium brand = 375.5 mg (\pm 175.5); $p = 0.445$). A significant difference was found in the cost of meeting the recommended intakes between own brand and premium brand supplements (Table 1; ($p = 0.018$)).

Discussion: The results of this study may be useful in evaluating cost effectiveness of omega-3 supplementation in several

Organisation	Recommended EPA and DHA (mg d ⁻¹)	Mean cost of meeting guideline (£) (\pm SD)	
		High street own brand supplements	Premium brand supplements
NATO (1989)	300–400	0.13 (\pm 0.64)–0.18 (\pm 0.85)	0.24 (\pm 0.10)–0.31 (\pm 0.14)
EANS (1998)	200	0.08 (\pm 0.04)	0.16 (\pm 0.07)
EFSA (2010)	250	0.10 (\pm 0.53)	0.20 (\pm 0.87)
ISSFAL (2004)	500	0.21 (\pm 0.11)	0.39 (\pm 0.17)
NHFA (2008)	1000–4000	0.50 (\pm 0.26)–1.68 (\pm 0.85)	0.94 (\pm 0.42)–3.13 (\pm 1.39)
AHA (2003)	2000–4000	0.84 (\pm 0.43)–1.68 (\pm 0.85)	1.57 (\pm 0.69)–3.13 (\pm 1.39)
ARUK (2007)	2700	1.13 (\pm 0.58)	2.12 (\pm 0.94)

medical conditions. The results indicate that the significant difference in cost of high street own brand and premium brand supplements is unlikely to be due to differences in EPA and DHA content. This is supported by the results of another study (3). Thus consumers may not need to purchase more expensive products in order to meet EPA and DHA recommended intakes. However these results may have limitations due to use of a single vendor and reliance on the manufacturers’ stated EPA and DHA content.

Conclusions: The results of this study indicate that there is a significant difference in the cost of meeting EPA and DHA recommendations using high street own brand and premium brand supplements, but there is no significant difference in the EPA and DHA content of supplements in these groups.

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AB58

Dietetics students’ views and experiences regarding the under representation of males within the dietetics profession: a cross sectional observational study

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Background: Males represent less than 4% of registered dietitians within the UK (British Dietetic Association, 2014). To date little research has been conducted to investigate the views, influences, and experiences of student dietitians regarding this under representation in the UK. The aim of this study was to compare the views and experiences of student dietitians

regarding the current gender representation within the profession.

Methods: All UK universities offering an under- and post-graduate pre-registration dietetics programme were invited to forward an online questionnaire to their dietetics students. The questionnaire, which was not pre-piloted, included a combination of multiple choice, multiple response and Likert scale questions. Descriptive statistics were used to interpret questions. Where an appropriate response sample size ($n > 5$) allowed, Fisher's Exact test was used to determine significant differences between male and female responses. Ethical approval was obtained from the University of Hertfordshire's Health and Human Sciences Ethics Committee.

Results: From 14 universities, 11 confirmed forwarding the questionnaire to students. The study recruited 213 students, 21 of which were male. Significantly more males compared with females believed that increasing the number of males within dietetics would enhance the profession (95% vs. 72% respectively, $p = 0.018$). The majority of females (57% vs. 19% males) first discovered dietetics whilst in secondary school or sixth form; males more often (81% vs. 43% females) discovered the profession at a later stage. Of the 213 respondents, 25% (33% males vs. 24% females) agreed that there were discriminatory factors associated with males entering the profession, yet 4.7% of respondents (all female) reported there were discriminatory factors associated with females entering the profession. The majority of both males and females (76.2% vs. 63% respectively) agree that the profession should actively try to increase the number of males within dietetics.

Discussion: The majority of male and female respondents agreed that increasing the number of males within dietetics would enhance the profession. These findings concur with data from Canada (Lordly, 2012), which identified that the majority of the respondents also believed this to be the case when asked a similar question. However, the British Dietetic Association does not yet appear to have a strategy to promote the profession to the male population as part of diversity or widening participation agenda (British Dietetic Association, 2015). The reasons behind males discovering dietetics at a later stage in their life is unclear and warrants further investigation. The data suggest that recruitment strategies for males might benefit from targeting secondary school and sixth form students. Discrimination towards minorities within a profession still occurs (Shih, 2013) – a phenomenon discovered in the present study, albeit regarding entering the profession. It would be prudent to further define what the perceived discriminatory factors within dietetics are.

Conclusion: The findings suggest that an increase in the number of male dietitians could enhance diversity and the profession in general. It appears that discriminatory factors might exist, however the present study has not identified if these factors impact those entering or already within the profession.

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AB59

A cross-sectional survey to explore dietitians involvement, knowledge and attitudes of Sickle Cell Disease in the UK

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Background: Sickle Cell Disease (SCD) is an untapped specialism in Dietetics despite being the most common and fastest growing genetic blood disorder in the UK¹. American Researches² have identified under nutrition as a critical feature of the condition, however nutrition remains underused and under recognised as a viable management tool. The aim of the survey was therefore to explore the levels of involvement, knowledge and attitudes of Dietitians of SCD in the UK.

Method: The survey, an online 10 question self-administered cross sectional questionnaire, was adapted from a similar questionnaire exploring GP involvement, knowledge and attitudes of SCD in Primary Care. The survey targeted BDA members of all levels with or without previous SCD experience and reminder emails sent to all BDA members via the ezine magazine. It was registered as a service evaluation and did not require ethical approval.

Results: A poor response rate was observed despite email reminders sent, only 50 Dietitians responded; 44 (89%) from the London region which has the highest incidence of SCD. From the 50 Dietitians, 27(54%) of Dietitians treated a sickle cell patient, (18) 67% in the last 2 years and only 6(22%) in the last 2–5 years. The two main factors affecting involvement was 14 (52%) did not have SCD caseload and 14 (52%) did not receive referrals for SCD patients. 33 (85%) of Dietitians indicated that adequate knowledge and understanding of the nutritional implications of SCD and 30 (77%) having specific nutritional guidelines and standards of care for SCD would increase involvement. Out of 33 (85%) Dietitians who responded, 20 (61%) reported to have some knowledge of SCD while 6(18%) reported to have no knowledge. 46 (92%)

completed the attitude statements. Out of 45 responses, 43 (96%) Dietitians disagreed that they do not have a role to play in managing the nutritional needs of SCD patients, 39 (87%) disagreed that the condition does not warrant regular dietetic input and 40 (89%) disagreed that nutritional guidelines are not needed to effectively manage SCD patients. 39 (87%) Dietitians agreed that SCD patients are not readily referred for dietetic input.

Discussion: The poor response rate is indicative that nutrition in SCD is underused and under recognised by Dietitians. However the findings suggest that Dietitians do recognise they have a role to play in the nutritional management of SCD. Improvements in dietetic involvement are therefore reliant on addressing the gaps in Dietitians knowledge of SCD and their understanding of the nutritional implications thereof. Helpful strategies include the development of SCD specific nutritional guidelines and standards of care. Increasing referral rates of SCD patients to Dietitians are needed to boost input for this patient population.

Conclusion: Dietitians have a significant role to play in managing the nutritional needs of SCD patients in the UK but without improvements to their knowledge and understanding of the specific nutritional implications of the condition, dietetic involvement will remain limited.

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AB60

An evaluation of a restructured dietetic placement programme centred on the Nutrition and Dietetic Care Process (NDCP)

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Background: Following the launch and incorporation of the Nutrition and Dietetic Care Process (NDCP) ⁽¹⁾ into the academic curriculum, King's College London University (KCL) and London Metropolitan University (LMU) updated the pre-registration dietetic practical experience. Feedback from practice educators highlighted time required to complete competency assessment tools as a barrier to quality supervision of students. This demonstrated a need to design a placement programme that supported the integration of the NDCP in the placement environment, and at the same time enabled efficient

and appropriate paperwork as evidence of competency development. The new style placements with learning outcomes and structured learning activities, based on the NDCP, was renamed '123'.

Aim: To measure perceptions of student confidence with the NDCP and hours spent on placement assessment tools following completion of a placement 2 (P2) in comparison to students who had completed the old style placement B (PB).

Method: A convenience sample of 139 students across 6 cohorts was used. This was an exploratory study and as a result there was no power calculation. Students were recruited over a 2 years period (September 2012–2014) after completion of their second placement on their return to their university during routine placement debriefs session. All students were requested to complete a questionnaire. The design was based on the author's experience and anecdotal evidence from students and practice educators regarding the placement learning experience. Face validity of the questionnaire was enhanced by review of its format and content by a placement tutor based at each university. Students were asked to rate their level of confidence in relation to the steps of the NDCP on a 5-point Likert scale and report the average number of hours they spent on assessment tools outside the standing working week. Ethics approval was obtained from LMU University Human Research Ethics Committee. Data was analysed using descriptive and nonparametric statistical tests.

Results: 68 (49%) of eligible students completed the questionnaire of which 53 met the inclusion criteria. Each student had completed 12 weeks of placement which provided data for a total of 636 placement weeks. 22 students (42%) had completed a P2 and 31 (58%) a PB. A Mann-Whitney U test was used to determine student confidence levels in carrying out all steps of the NDCP in clinical practice and hours spent working on portfolio forms outside the working days scores between P2 and PB students. Distributions of student confidence levels for both placements were similar for all aspects of NDCP. Median confidence level score was statistically significantly higher for undertaking nutritional assessment tasks for patient care (step 1 of NDCP) for P2 (5.0) than in PB (4.0), $U = 464$, $z = 2.545$, $p = 0.011$. There was a statistically significant difference for median hours spent on assessment tools outside the working week (median score PB = 3.0, P2 = 2.0), $U = 205.5$, $z = -2.546$, $p = 0.011$.

Discussion: This is the first UK evaluation of students' placement experience directly comparing two different placement structures. This study demonstrates that use of a care process model (NDCP) introduced at university and subsequently to structure placement learning outcomes and activities, helped to increase student confidence for dietetic care. The reduced amount of paperwork required to demonstrate achievement of learning outcomes potentially maximises opportunities for clinical practice.

Conclusion: Further research is recommended in dietetic placement learning to improve the student learning experience

while reducing paperwork burden for learners and practice educators.

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AB61

A qualitative exploration of the value of volunteering to the employability of nutrition and dietetic graduates amongst employers

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Background: Volunteering is widely considered to be beneficial to both, the volunteer and the community. It helps volunteers develop transferrable skills such as communication, collaboration, team working and general care towards the society. Whilst there is research that supports the value of volunteering, evidence gathered is largely from the area of education and there is a need for it to be further explored in the field of dietetics (Jones, 2013). The aim of this qualitative study was to understand and gather opinions from employers regarding volunteering of newly qualified dietetic graduates.

Methods: Dietetic managers from the NHS trusts in four cities across the northern and eastern part of England were invited to participate in this study and four consented to take part. They were contacted through the contact detail list that was obtained from the NHS websites which were open access. Semi-structured, one to one interviews were conducted over the telephone which lasted about thirty minutes. A topic guide based on the aims and objectives of the research was developed that helped to steer the direction of the interview and the participants were asked to speak freely on the topic. The interviews were recorded and then transcribed verbatim. Thereafter, the data were grouped and coded using inductive thematic analysis which facilitated extracting information from the data, developing taxonomies or classifications and thereafter identifying the relationship between themes. An inductive thematic analyses procedure was used to derive categories which emerged from the data after repeated readings of the transcripts and the identification of the key concepts. Ethical approval was obtained before data collection started.

Results: Based on the data that emerged from the themes, the participants' views, ideas and comments were noted, grouped and coded into four themes. Broadly, these encompassed the following: "Adds value", "Transferrable skills", "Experience" and "Academic results". Overall, each of the four managers had a very similar approach to the topic with only very slight

variations in their views. All four participants confirmed the importance and value of volunteering and its value in promoting the employability of graduates. Furthermore, they added that volunteering adds value in the ability to perform, in developing transferrable skills, getting experience. Employers stated that academic results were not top priority at the time of recruitment as some other skills were. In relation to volunteering, Volunteering was held in high regard by the participants, which they believed would enhance the quality of the work of future employees.

Discussion: The aim of this qualitative study was to explore the views of dietetic managers regarding volunteering of newly qualified graduates seeking employment. The view point of participants, demonstrating benefits of volunteering, are in accordance with a study conducted previously in the field of education (Simha, Topuzova & Albert, 2011). The present research exposed and highlighted similar views of the participants with a slight variation, whereby, all the participants in this study had a similar approach to the topic, emphasising the importance of volunteering. The findings from this study also indicated that volunteering has positive repercussions for students in terms of enhanced employability and this is in accordance with another study undertaken in university students (Holdsworth & Quinn, 2010). Robust finding suggested that volunteering does benefit newly qualified graduates in the competitive segments of the job market and increases the prospects of employability (Jenkinson et al., 2013). Increased awareness of the value of volunteering to prospective employers may encourage students to engage more in these activities and to describe them in job applications in order to improve their future work opportunities.

Conclusions: This research identified that the employers interviewed regard volunteering favourably confirming the importance of volunteering by newly qualified dietetic graduates as this may have a positive impact on their employability.

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AB62**Observational study of staff training and knowledge of diabetes mellitus in a nursing home****P Roper & L Walker***Department of Nutritional Sciences, Faculty of Health and Medical Sciences, University of Surrey, UK*

Background: UK guidelines state that all staff working in institutional care homes should have completed diabetes training (1). Staff should meet specific learning objectives as detailed in a competency framework published by The Institute of Diabetes for Older People (IDOP) (2). The Care Quality Commission (CQC) highlights staff knowledge as part of their fundamental standards, although this is not monitored at every inspection. Audits of diabetes knowledge and training in residential homes are limited, but suggest standards are not being met (3,4). This study aimed to audit staff knowledge and training in a nursing home against guidelines.

Methods: This study was a cross sectional survey. All data were collected using a questionnaire validated for content validity and readability, designed to audit against a gold standard of 'non-direct patient care' competence objectives selected from the IDOP competency framework (2). The questionnaire consisted of seven sections and twenty-five questions. Sections were a short introduction, 'what is diabetes', 'types of diabetes', 'treatment and care planning', 'complications', 'nutritional advice' and 'more information'. Job roles included were nurses, care, kitchen, and activities assistants, all of whom have direct contact with residents. Twenty seven participants were recruited, in person, from a nursing home in Somerset, and completed the questionnaire independently on paper. Twenty six participants were suitable for analysis. Anonymous data were analysed using IBM SPSS Statistics 22(2015). Mann-Whitney U-test was used to analyse data for differences between scores for job roles and according to whether participants had received training. The Kruskal-Wallis test was used to analyse for differences in the kind of training given, who provided the training and when it had taken place. Statistical significance was accepted at $p < 0.05$.

Results: Median overall score (% correct answers) was 76%. Interquartile range was 28 to 80%. 'Treatment and care planning' (84%), 'complications' (79%), and 'more information' (81%) had higher percentages of correct answers given than 'what is diabetes' (56%), 'types of diabetes' (50%), and 'nutritional advice' (59%). For the 'nutritional advice' section staff were expected to demonstrate sufficient knowledge to reiterate recommendations given by dietitians, and dispel common misconceptions. Half of all participants had received training ($n = 13$) however overall score was not significantly different from those who had not received training ($p = 0.64$). No significant difference was found between overall scores in relation to type of training received by those who had training ($p = 0.083$), when training was given ($p = 0.284$), or who training was given by ($p = 0.122$). The

only job role demonstrating significantly higher overall scores was that of nurses ($p < 0.04$).

Discussion: IDOP require 75% of learning objectives to be met. As this study included only 'non-direct patient care' learning objectives, the median score suggests learning objectives may not be met for 'direct patient care' learning objectives. Half of all staff had received training, and those who had, did not appear to show greater knowledge. These results suggest guidelines for diabetes training and knowledge are not being followed in this nursing home. This is similar to results of other UK audits (3,4).

Conclusion: Current guidelines for diabetes training are not being followed in this nursing home. Gaps in staff knowledge identified in this study, such as 'nutritional advice', could be used to inform future training needs. This could result in improved standards of care for those with diabetes in nursing homes, and a positive reinforcement of advice provided by dietitians.

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AB63**A systematic review investigating the efficacy of ketogenic diet therapies for the treatment of seizure, movement disorders and cognitive development in glucose transporter type 1 deficiency syndrome****PJU Swift & L King***Nutrition and Dietetics, Faculty of Health and Social Sciences, Leeds Beckett University, Leeds, UK*

Background: A clearer understanding of treatment efficacy and the long term effects of ketogenic diet (KD) therapies will help improve care in GLUT1-DS⁽¹⁾. A classic KD produces significant levels of blood ketones, compensating for the limited energy supply to the central nervous system caused by dysfunctional Glut1 proteins. Although ketosis measures lower

on a Modified Atkins diet (MAD), a number of reports suggest comparability against a classic KD. The aim was to consolidate evidence and evaluate the efficacy of using a classic KD or modified Atkins diet (MAD) in the treatment of seizures, movement disorders (MD) and cognitive development (CD) in GLUT1-DS. Potential associations between blood ketone measures and better outcomes, as well as adverse effects were also explored.

Methods: Electronic databases including The Cochrane library, Google Scholar, institutional based EBSCO Discovery Service, Web of Science, PubMed and CINAHL were comprehensively searched between Dec 2014 and Feb 2015 with further 'snowballing' techniques. Eligible studies met several criteria including those with formally diagnosed GLUT1-DS patients receiving either a classic KD or an MAD against one or more primary outcomes from 1991–2015. Risk of bias was assessed through critical appraisal and utilising a modified version of a validated tool ⁽²⁾, subjected to further validity and reliability testing.

Results: A combined total of 1946 records were identified. 14 Non-randomised studies were included after quality assessment, with individual participant's data extracted and reviewed separately. A combined total of 241/371 participants had a confirmed diagnosis of GLUT1-DS. 199/241 participants received varying periods of dietary intervention, 168 on a classic KD and 31 on an MAD. On a classic KD, 62.3% of seizure affected individuals achieved resolution after starting the diet, 20% improved considerably. 12% of MD affected individuals achieved resolution after starting the diet, 58% showed improvement. With respect to CD 51% showed improvements attributed to increased alertness and behaviour, the remaining showing no appreciable changes. Of those receiving MAD therapy, 30% of seizure affected participants achieved resolution, 40% markedly improved. 15% of MD affected individuals achieved resolution, 62% improved towards functional gains. With respect to CD, 80% presented improvements in areas such as memory, processing speed and changes in general intelligence quota, 20% indicated a lack of appreciable changes. No firm conclusions between the relationship of ketosis with outcomes and adverse effects could be made due to heterogeneity and lack of evidence.

Discussion: Some participant's required additional anti-epileptic drugs and some did not improve, reasons are occluded by current lack of understanding and complex mechanisms within GLUT1-DS brain metabolism. Phenotypical and age variations were not systematically factored into analysis due to lack of evidence base for prognostic factors within GLUT1-DS. Considerably fewer participants were available for review against an MAD, with the majority of those individuals in adolescence or adulthood, making comparison between diets tentative.

Conclusion: Both classic KD and MAD therapies produce discernible clinical benefits with respect to resolution or significant improvements in seizures and complex MD in the majority of GLUT1-DS patients. An MAD could be considered

as a replacement or following from a classic KD in adolescence onwards, where a less restrictive diet and changes in primary symptoms is indicated.

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AB64

A qualitative study exploring the role of religion on diet choices in Seventh-day Adventist University Students

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Background: There is an emerging body of evidence related to the area of religion, diet and health. Studies among Jews, Evangelicals, Hindus and Buddhists encourage particular dietary practices. There is evidence regarding the association of Seventh-day Adventist's (SDA's) and positive health outcomes in relation to dietary choices¹. The evidence is limited regarding what individuals feel about the role religion plays in their food choices and how this impacts their dietary behaviour. The aim of this study is to develop an understanding of the way religion influences diet and food choices in SDA students.

Methods: This study followed a qualitative phenomenological approach which captured the lived experience of SDA's regarding the way their beliefs influence their dietary choices. Four participants were recruited from the Adventist Society using purposive sampling on the Coventry University campus. Individual semi-structured interviews were conducted using questions developed based on the research area and were audio recorded and transcribed verbatim. Thematic analysis was used to categorise data into emerging themes. Member checking and peer review were included to maintain participant views. Ethical approval was granted from Coventry University.

Results: Five themes were identified: dietary choices, religious and social influence, motivation through impact on the 'whole-person' and spiritual journey. The participants mentioned food and dietary choices to: refrain from consuming meat, dairy products, drinking plenty of water and refraining from caffeinated drinks. The participants were motivated by the impact these choices had on their 'whole being'. They believed that their diet impacted them physically: 'when I'm vegetarian I'm lighter as in I'm not bloated.' It also has an

impact on them spiritually: 'So if I don't eat meat for like a certain amount of time, then it becomes easier for God to have a greater influence in my life.' This was also then demonstrated through responses that suggested progression of a spiritual journey: 'And I think as I grow in my spiritual relationship with God... then I will kinda draw away from meat products.'

Discussion: Religious teachings from The Bible and Ellen White, influence participants to make a conscious effort to aim towards a plant-based diet (the original diet). In addition to this, there is also a notable impact of culture these choices e.g. upbringing and immediate peer influence. Both this research and that of Nath² showed participants felt their diet had an impact on their spirituality as well as their physical and mental health. Despite the small sample size (restricted due to time constraints), validity in qualitative research is gained from meaningful, information rich data rather than from a large number of participants. Nevertheless, in order to obtain transferable results, data saturation within the greater population of SDA students would be advantageous. Although the researcher was also an SDA, an inside view enhanced the interpretation of themes. Nonetheless, the researcher reflected critically on their influence throughout the research to prevent any unfair bias and enhance reflexivity.

Conclusion: Religious teachings, culture, physical and spiritual benefit are instrumental in influencing the dietary choices of SDA university students. This impact of diet on spiritual well-being and the spiritual drive to change dietary behaviours are important aspects to consider in dietetic consultations. This may then lead to more effective behaviour change with this patient group.

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AB65

An investigation of the association between perceived stress and food choice and nutrient intake in university students

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Background: Academic stress is believed to influence university students' food choices⁽¹⁾. There is a lack of research exploring the relationship between academic stress and food choices made by university students in the UK. This study

aimed to investigate the association between perceived stress and food intake in university students.

Methods: After ethical approval was obtained from the University of Nottingham School of Biosciences Research Ethics Committee, 43 participants (40 females, 3 males) were recruited to the study by a convenience sample. A Perceived Stress Scale (PSS)⁽²⁾ and 24 hours dietary recall questionnaire were utilised. Data was obtained from 33 individuals at baseline (31 females, 2 males), following ten participants failing to submit questionnaires. This was anticipated to be a period of reduced stress. Follow-up data collection was repeated 5 weeks later in which 15 participants (15 females, 0 males) completed the questionnaires. This produced an attrition rate of 54.5%. It was envisaged more stress would occur at follow-up due to an increased amount of coursework assignments. The PSS score was calculated by totalling the assigned responses given by participants (on a scale of 0-4) to the 14-item questionnaire. An increased PSS score indicates a greater level of perceived stress. The 24 hours dietary recalls were analysed using Dietplan 6⁽³⁾. Pearson's analyses were utilised to assess correlations between PSS and 24 hours recall data on all data obtained at baseline and follow-up. Paired t-tests were utilised to compare differences between baseline and follow-up on the 15 participants who had a complete data set.

Results: Average PSS score increased from 25.47 ± 1.44 at baseline to 28.27 ± 1.84 at follow-up ($p = 0.07$). Significant increases in mean energy, protein, carbohydrate and sugar consumption were identified between baseline and follow-up ($p < 0.05$). There were no significant differences in fat, fruit and vegetables, alcohol, sodium, iron and calcium intakes between baseline and follow-up ($p > 0.05$). A significant negative correlation between PSS score and fruit and vegetable consumption (portion size measured in grams) occurred at baseline ($r = -0.39$, $p < 0.05$). Thus suggesting lower fruit and vegetable consumption in students reporting greater levels of perceived stress. This correlation was not seen at the 5 week follow-up. Other dietary variables were not correlated with PSS scores.

Discussion: The students increased their energy and sugar consumption between baseline and follow-up. It is unclear whether this is due to academic stress. Students' finances to spend on food may have depleted towards the end of term which may have confounded the results. Students experiencing very high levels of stress may have felt too stressed to complete the follow-up questionnaires and hence the results may be skewed. The accuracy of completion of the 24 hours recall questionnaires fluctuated and participants may have under-reported their food intake. Furthermore the PSS is over 30 years old and the questions may not have been applicable to all students surveyed. Similarly the sample size was small and may not be representative of an entire student population. Therefore further research is needed to clarify the association between academic stress and university students' food intakes and to justify the need for dietitians

developing nutrition and stress management interventions at universities.

Conclusion: Perceived stress instigated by academic demands may result in altered food choices and nutrient intakes in university students living in the UK.

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AB66

A qualitative case study of local obesity policy

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Background: This research explores how obesity policy is translated, formulated and implemented in practice, at a local area level, through a set of case studies in South Yorkshire, exploring the public policy process, whilst understanding the perspectives of those involved. The focus is on the two main argumentative frames employed in obesity: neo-liberal rationales of personal responsibility and choice, and the social responsibility model of obesogenic environments (1). Using Colebatch's questions for policy analysis as a framework (2). The aim was to examine the policy process and perspectives of those involved, asking, whether and how their perspectives influence the policy process and decisions, and what implications this has for addressing obesity.

Methods: The study used an interpretative qualitative approach, exploring the different socio-political contextual factors that influence policy processes. The study employed documentary analysis using a Framing Matrix (3,4), and semi structured interviews and focus groups, lasting approx. 1 hour per interview. The participants (n = 40) were recruited through purposive sampling of Local Authority and Clinical Commissioning Group leaders, public health commissioners and providers of weight management services who were involved in health and wellbeing boards and obesity policy and/or delivery. The documents and transcripts were analysed by Thematic Analysis. Ethical approval was granted through Sheffield University, Local Ethics Panels & IRAS.

Results: Analysis of the participant interviews found that the factors shown in Figure 1 influenced obesity policy decision making (translation, formulation & implementation) in South Yorkshire.



Figure 1 Factors influencing Obesity Decision-Making at a Local Level (Simple Diagram).

Discussion: Analysis of the interviews and documents, revealed that obesity policy processes at a local level are messy. There are many and varied influences on decision-making locally (see figure 1). Difficulties cited included people's position and power, a national and local commissioning pathway that is fractured and local commissioning abilities, an unclear Health & Wellbeing Board governance role, and lack of clarity and direction. Food is framed as the cause of obesity with Physical Activity proposed as the main solution. The challenges, from a policy process perspective are: a lack of evidence of effectiveness of what to do locally; reducing resource; increasing attention on prevention and a reduction in funding treatment. Locally policies for children are more prevalent, at the expense of policies or action for adults; with a gap appearing in policies supporting and funding treatment, especially for adults. There was also a lack of political support for action on obesity in some of the areas studied.

Conclusion: This study of local obesity policy processes and experiences, analysed using the two main obesity argumentative frames, offers a new perspective on obesity policy processes locally. It underlines the role of leadership, commissioning competence and the commissioning pathway and discusses the 'messy' nature of local policy processes which, along with national shifts, have had the resultant impact of a reduction in resource and action on obesity at a local level.

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AB67**A qualitative study of the role of meals-on-wheels delivery drivers and their potential for recognising elderly clients at risk of poor nutritional status****E West & J McClinchy***School of Life and Medical Sciences, University of Hertfordshire, College Lane, Hatfield, Hertfordshire, UK*

Background: Malnutrition among the community-dwelling elderly population is frequently under-recognised. In particular, recipients of meals-on-wheels (MOW) are more likely to have poor nutritional status⁽¹⁾. MOW provides hot meals to those in need and may also have a role of increasing social contact, stimulating a renewed interest in food and regularising meal times⁽²⁾. Whilst MOW delivery drivers receive little or no training to recognise malnutrition, due to their daily visits and a relationship with clients built on the provision of food, an extension of their role to recognise and report the poor nutritional status of their clients may be feasible. This study aims to explore the current role of MOW delivery drivers and their potential to identify clients at risk of malnutrition.

Methods: In-depth semi-structured telephone interviews were conducted with three female and one male delivery drivers aged between 39 and 63 from a MOW organisation based in the East of England. The participants volunteered to take part following an advertisement. The acceptability and relevance of the interview questions were explored via a pilot interview with another driver. The questions explored the nature of the drivers' roles and relationships with their clients. The interviews were transcribed verbatim and analysed using the thematic approach. Ethical approval from the University of Hertfordshire Ethics Committee with Delegated Authority was obtained for this study.

Results: The following themes emerged: 'a role beyond food delivery', 'a unique insight into eating habits' and 'time constraints'. All drivers felt their visits encouraged and prompted their clients to eat, especially for those who may otherwise be unwilling or unable to prepare food. Furthermore, regular contact allowed the discovery of detrimental behaviour such as food hoarding. These instances were always reported to the supervisor who contacted the clients' next of kin as per the organisation's safe-guarding protocol. However the lack of time spent with each client was highlighted as a key limitation of their role. Whilst the drivers only had a few minutes with each client, all participants expressed longer visits would enable them to help more: '...to them you're just a person bringing their dinner... But if you go in there for 15 minutes, you get to see them as a friend.' (Driver 3).

Discussion: The drivers' insight into their clients' eating habits may help in recognising signs of poor nutrition. In

line with other research, the drivers noted food hoarding and the potential for MOW recipients to delay consuming their delivered meal, leading to decreased intake and an increased likelihood of the growth of harmful bacteria in food⁽³⁾. The drivers reporting such instances to facilitate an intervention is especially pertinent for vulnerable clients with compromised immune systems. Despite this, other than recognising certain behaviours, it is unclear whether drivers would be able to identify other signs of malnutrition without further training. Furthermore, the length of the visit would need extending to allow any assessment of nutritional status.

Conclusion: With appropriate training and provision of time, MOW delivery drivers have the access, insight, and sensibility to act as key individuals in recognising poor nutrition of their clients.

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AB68**Factors which influence the completion of food record charts (FRC)****H Whitfield¹ & K Whitehead²***¹New Cross Hospital, Wolverhampton, UK and ²School of Biosciences, Division of Nutritional Sciences, University of Nottingham, Leicestershire, UK*

Background: 29% of individuals admitted to hospital are malnourished (Russell 2014) which can lead to adverse physical and psychological consequences increasing length of stay and incurring significant costs. Poor nutritional intake and increased requirements contribute to malnutrition (Kubrak 2007). A good FRC can form the basis of a nutritional assessment (Freeman 2002). The Care Quality Commission (CQC) (2011) note short falls in documentation of food and drink intake. The aim of this review was to identify the influences (positive and negative) on completing FRCs.

Methods: Medline, Embase, Web of Science and CINAHL were searched using – (Document* or Record*) & (Nutrition* or Food or Diet* or intake) & (Acute or Inpatient or Hospital or Ward) & (Malnutrition or Undernutrition). Inclusion and exclusion criteria are summarised in Table 1.

Table 1 Inclusion and exclusion criteria

Inclusion Criteria:	Exclusion Criteria:
Primary research in hospital/nursing home in developed country. English Language. Published January 2004 to December 2013.	Participants in community. Not developed country. Not English Language. Prior to 2004. No full text, conference proceeding/abstract. Animal study. Review/consensus document.

Titles, abstracts or full papers were read as required to see if the inclusion criteria were met and the paper addressed the aim. A customised data collection form was developed to extract information from quantitative papers as suggested for data including non-randomised studies. Qualitative aspects of the research were considered separately and key themes were recorded and compared. Quality issues in quantitative research were considered with a score devised in which studies scored 0, 1 or 2 in eight questions.

Results: Eleven studies met the inclusion criteria – six quantitative, two qualitative and three using mixed methods. Nine measured documentation of oral intake. Statistically significant improvements in the documentation of energy intake of between 26% ($p = 0.0024$) and 53% ($p = 0.001$) were seen in two studies after changing the design of the documentation, care plan or addressing barriers identified in focus groups. Protected meal times saw the number of patients on FRC/fluid charts increasing by 11% ($p = 0.02$). Key qualitative themes identified: no one staff group had responsibility (3 studies), need for educational programmes (3 studies) and too few staff (2 studies). Seven questions were applied to qualitative studies to address quality; a lack of reflexivity was noted.

Discussion: Limited research focuses on FRC despite the human and financial cost of malnutrition and shortcomings identified by CQC. Changes to improve FRC completion were identified, but with little information on the sustainability of these. It may be that the focus groups themselves highlighted the issue of malnutrition to participants leading to improved compliance. Quality scores varied but suggest that robust research into this area may be challenging. Few studies had adequate statistical power or monitored the maintenance of changes for sufficient time; this would need to be considered in further research.

Conclusion: Protected mealtimes and staff focus groups improved FRC completion these and barriers around staffing, lack of education and responsibility could be areas to focus on in practice whilst further research is completed to look at the long term effects of investment into these areas.

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